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## FOOTPRINTS: THE JUBILEE OF THE PÆDIATRIC SOCIETY IN VICTORIA.[1]

By HOWARD BOYD GRAHAM,
*Melbourne.*

> We should endeavour to do something so that we may say that we have not lived in vain, that we may leave some impress of ourselves on the sands of time.
>
> NAPOLEON BONAPARTE.

THE title "Footprints" has been chosen for this address for two reasons; one will be concealed for a while, but the other we may as well expose without delay. The title is accompanied by a motto which is said to be taken from a letter of the Emperor Napoleon to one of his Ministers of State. An echo came in 1838 from across the Atlantic, when Longfellow expressed the same idea in unforgettable lines in "A Psalm of Life". The Pædiatric Society of Victoria has passed through seven cycles of seven years, and we are marking the end of the year of jubilee with a bumper scientific programme spread out for a week. Before enjoying this feast, which should demonstrate our present status, it is fitting that we should scan the vista of the years for footprints by means of which we may trace the progress of our Society from its origin in 1906. Some of the impressions are sharp and deep, others are blurred, and doubtless some are obliterated or scarcely perceptible. We must resist the temptation to go beyond footprints; we cannot attempt profiles even of the leaders or lengthy descriptions of events or subjects in the time at our disposal.

### Surviving Founders and Old Members.

Young people in a young country such as ours probably regard fifty years as a long period of time, the passing of which is to be celebrated as if it ended at the portals of a new era. We cannot all be expected to agree about that with our younger colleagues; it does not seem so long ago since I came upon the scene myself in 1920, and others present today have served longer. Indeed, I can name some who were hard at work at the Children's Hospital in or before 1906, who are still extant and by no means extinct. As it is probable that they were foundation members, they should be named. The evergreen "Herbie" Hewlett[1] is the daddy of them all; he has been on the hospital staff at least since 1900. He introduced the "Röntgen X rays" at first as a sideline, and later pursued the development of radiology as a passion to which he has devoted himself ever since. He was in charge of the important department of radiology for a very long time, and has retained an interest in it as consulting radiologist. Until the heavy tramp and vibrant tones of Colin Macdonald rejoiced our members, Herbie had lots to tell us at pædiatric meetings. Next comes "Lou" Balfour, who clearly remembers the floating of the Society. He was a member of the honorary medical staff of the out-patient

[1] Read at the Jubilee Meeting of the Pædiatric Society of Victoria, Melbourne, March 11 to 15, 1957.

[1] Dr. Herbert Maunsell Hewlett died on July 28, 1957.

department from 1903 to the end of 1909. His footprints as symbols are blurred, but he is hale and hearty and his real tread is firm and steady. Way back in 1903 the hospital needed only three resident medical officers. Our late dearly beloved Harry Stephens was the senior one, and he was supported by "Alf" Rowden White and "Geoff" Owen. Dr. Owen is living in retirement at Vermont. Dr. Rowden White is well known to us all; he was active in the hospital and at our meetings for at least twenty-five years, and is a consulting physician of the hospital. Percy Brett was on the resident medical staff in 1905 and 1906. He was the senior resident when the Society was formed. His successors in that high office know full well that they have all had to work hard on the detailed organization of pædiatric meetings at the hospital. We may be sure that Percy Brett set the standard of excellence. Junior in 1906 to Percy Brett was our old friend "Les" Forsyth, whose impress is heavy in our ranks. He pioneered bacteriological research work, but he had to do it at the bacteriological laboratory at the University of Melbourne, using material collected at the hospital. They had to wait several years before there was a laboratory of any kind at the hospital. However, Les Forsyth blazed the trail by establishing the need for it, and with the support of seniors such as "Dicky" Stawell he took a leading part in the fight for it. We often had the chance to argue with Les; he was not the one to suffer fools, but he was staunch, fond of children, well informed and dynamic. He was active as a member of the honorary medical staff for about forty years and is a consulting member now.[1] Hume Turnbull was also a resident medical officer in 1906, and he was the senior one in 1907. Until 1924 he was a member of the honorary medical staff on the active list, and he is now a consulting member. He too indulged in clinical research work and was erudite in cardiology, but became somewhat cynical and nihilistic about drug therapy. He has always been a fine, honest-minded physician with high standards. His contributions to our Society, though not very numerous, were inspiring and sound.

There may be others living who were founders, but these are all that have been traced. Harvey Sutton, now a Professor Emeritus in Sydney, was on the resident medical staff in 1903 and 1904, and he was senior resident in 1905; he then became a Rhodes Scholar and went off to Oxford. From 1910 to 1915 he was chief of the medical service of the Education Department in Victoria. He was intensely interested in child care and in preventive medicine. Konrad Hiller, father of Harry Hiller, the present successor in office to "Herbie" Hewlett, took a prominent part in the early activities of our Society. Konrad was a resident medical officer at the Children's Hospital in 1904. He went abroad later and was probably away in 1906. On his return he introduced Ehrlich's famous "Salvarsan" ("606") and the technique of the Wassermann test. He did the testing for syphilis at the University of Melbourne for a while, and established its value locally. There are many other early members still about, including Emeritus Professor W. A. Osborne, Balcombe Quick, "Teddy" White, "Monty" Silberberg, "Bill" Upjohn, David Embelton and Reginald Webster. Roland Wettenhall, who graduated in 1906, was our dermatologist for a long time between the two wars. Alan McCutcheon, the present president of the Victorian Branch of the British Medical Association, has followed closely in the footsteps of Hobill Cole, even to the occupancy of the treasurership of our Society for many years.

Some familiar faces at our meetings in "the years between" were those of "Bill" McLaren, Alfred Derham, Charles Littlejohn, Frank Norris, Cecil Colville, Charles Osborn, Jim and David Officer Brown, Keith Hallam and Vernon Brown, to name only a few of those who are still about—which is an invidious thing to do. I have even left out "Sandy" McLorinan and Charles Richardson, but then they still attend pretty regularly.

### The Parade Ground.

Lest my second reason for introducing symbols becomes too blatantly obvious, I shall digress to notice the presence of Professor Ashley Weech, the distinguished pædiatrician from Cincinnati. We have had American friends with us before. It is not long since we welcomed McNair Scott. We remember that during the American invasion the Royal Melbourne Hospital was captured; Hayman, Johnson and Bronson, all I think from Cleveland, were some from that military hospital who came to our meetings in 1942 and exchanged ideas with us. Professor Weech may like to know that we know about a certain East Window of the Hall on the third floor of the Mayo Foundation House at Rochester.[1] Let us focus our attention for a few moments on the upper three panels of that glorious window. All three panels represent the place of medicine since 1900 in the history of medicine. They will thus serve to illustrate in a general way the nature of the parade ground on which we are seeking to identify footprints. This is the era of preventive medicine, and in it pædiatrics has become a speciality of outstanding interest and importance. Its growth, as elsewhere, has been conspicuous in the scientific activities of our Society. The main trends are so well appreciated that we need not delineate them now. The central upper panel of that memorial window represents the search for truth in the practice of preventive medicine as practised in the everyday work of family physicians. The parallel medical education and medical research are the themes of the two flanking upper panels of the memorial window. In our Pædiatric Society the central project has been the study of cases with the children present for examination. Informative features have been supplied and by free discussion we have attempted to establish the truth. Parallel projects have been the lectures and demonstrations presented by those who have conducted clinical and laboratory research work. Decidedly, they have been educational in character. Thus it was in the beginning and still is.

### Origins, Machinery and Dramatis Personæ.

Of many still active in our Society, of more than thirty years' service, and other than those already named, special mention has been merited by Robert Southby, Lawrence Stokes, Jean Macnamara, Kate Campbell, and Douglas Galbraith, and there are probably others. A special tribute must be paid to our doyen, Reginald Webster. Month in, month out, for at least forty of our fifty years, he has enlightened us with erudition, patience and eloquence on almost every pædiatric facet of pathology, but outstandingly on the intricacies of tuberculosis.

The story of the origin of our Pædiatric Society is not without interest. It must commence with some account of our founders. It is traditional that members of a hospital staff usually give long and faithful service, but there cannot often have been a team who were thicker as mates than those at the helm of our hospital work in 1906. When we examined some of the "Beacons On Our Way" together nearly four years ago, we covered the Snowball period (1878-1902) pretty well, and we had a glimpse into the next decade. We saw the giant "Snowy" with his able lieutenants, Charlie Ryan and Peter Bennie. Then Dicky Stawell, Jeff Wood and Hammy Russell came upon the scene. With them and not far behind came Alan Mackay, Hobill Cole and Willie Wood. Wilfrid Kent Hughes, Charles Lempriere, Percy Webster, Dave Officer, Jocky Noyes, Crawford Mollison, and Charles Perry were in the wings. The up-and-coming youngsters were Harry Douglas Stephens, Colin MacKenzie, Gerald Weigall, Harry Summons, Harvey Sutton, Stewart Ferguson, and others. It was customary for aspiring pædiatricians to make a grand tour before they settled down, and often another to dislodge themselves from ruts. Many of those just named had served an apprenticeship at Great Ormond Street Children's Hospital, London, where they met men such as Batten, Still, Robert Hutchison, Ballance, Collier and Arbuthnot Lane. They came under the charm of men such as John Thomson at Edinburgh and Hugh Owen Thomas and Robert Jones at Liverpool, and of orthopædic artists such as Lovett at Harvard and Goldthwait of Boston.

Alan Mackay returned from one of these jaunts in 1905. His soul mates celebrated in the good old fashion by tendering him a dinner, which took place on November 11, 1905. They welcomed him back to the fold, and he told of clinical meetings abroad at which staff members mingled

[1] Dr. Robert Leslie Forsyth died on April 26, 1957.

[1] "A Stained Glass Window on the History of Medicine", by D. C. Balfour and T. E. Keys, *Bull. M. Library Association*, Vol. 32, No. 4, October, 1944.

their experiences, grave and gay. It was decided there and then to form the Melbourne Pædiatric Society, which met first on January 31, 1906. Harry Stephens was the prime organizer, and was the worthy secretary for the next eighteen years. Early in the piece he had been abroad. He not only visited Great Britain and Europe, but included the United States of America and the Orient in his tour. He met most of the leading pædiatricians and orthopædic surgeons of the time. None of our number has been more highly trained as the complete pædiatrician; sharp division between those who do and those who do not operate has since militated against this completeness, and the expanding field of child study, psychology, child health, infant welfare, and preventive medicine, and narrower specialization, have made it unlikely that we shall have any more complete pædiatricians.

The Melbourne Pædiatric Society did not have a written constitution or a legally qualified name until, after the formation of the Australian Pædiatric Association in 1950, these matters were rectified and our Society became the Pædiatric Society of Victoria. It has now to toe the line and behave according to its rules and regulations. In earlier years the pattern evolved by custom established by mutual consent and constant repetition. Our older adherents will be relieved to know that those precedents were carefully preserved and were embodied in the constitution, and that Harry Stephens himself attended a meeting at which it took its final shape, on the day before he died.

The original Society was a society of friends, and it has always been that way; the spirit of *camaraderie* at the hospital between professional people and the management, and between seniors and juniors, has been notable through the years. It is probable that the contacts with the children and the common love of children has been the bond; but the relaxation of discipline, which is inevitable, and indeed desirable, in a hospital for children, has eased the frustrating effect of formality and has softened the human relationships. After our meetings it has been customary to join in informal conversation over tea and coffee taken with attractive food and served to us by nurses.

In 1906, at the time when our Society was founded, Hamilton Russell was active at the Alfred Hospital; but he, with Noyes the dermatologist, Mollison the pathologist, and others, was on the consulting staff of the Children's Hospital. The honorary attending medical officers, as they were called, did in-patient and out-patient work, medical, surgical and orthopædic—in fact, all classes of pædiatric work. Twelve in number, in order of seniority they were: Charles Ryan, Peter Bennie, A. J. Wood, F. H. Cole, Charles Lempriere, R. R. Stawell, E. Alan Mackay, W. A. Wood, David Officer, Wilfrid Kent Hughes, Herbert Hewlett and Charles Perry. They had the assistance of junior staff members entitled "honorary clinical assistants to out-patients". Seven in number, they were, in order of seniority: W. Colin MacKenzie, J. H. Nattrass, Gerald Weigall, L. J. Balfour, H. Douglas Stephens, Basil Kilvington and W. Harry Summons. Hewlett was also radiologist, Stephens was also pathologist, and Percy Webster was honorary oculist. From 1903 to 1910 Mrs. R. Murray Smith was president of the Committee of Management; and in 1906 Mr. R. J. Love became acting secretary, a post in which he was soon confirmed and which he occupied with conspicuous success for twenty years. He and his successors, Mr. Howard Barrett and Mr. W. S. Feint, have worked well with the medical staff and have helped materially to obtain amenities and privileges for the Pædiatric Society and for other medical activities at the hospital. Their help has been greatly appreciated.

### The Pattern of Proceedings at Meetings.

Now we must veer off persons and look into activities; footprints may also be indicators of action. The first meeting of which there is a record is the second annual meeting, which was held on Wednesday, February 19, 1908. In the absence of the President, Peter Bennie, Wilfrid Kent Hughes was chairman. Jeff Wood was elected president, Hobill Cole treasurer and vice-president, H. D. Stephens honorary secretary, and W. A. Wood, Kent Hughes and Charles Perry completed the committee. Forsyth, for Stawell, demonstrated from the cases of three babies with infantile diarrhœa some of the clinical features and bacteriological findings and cultures. Jeff Wood showed a two-year-old boy with multiple naevi. Kent Hughes produced a patient who had been subjected to surgery ten years earlier for complete syndactylism of fingers, and went on to demonstrate other operative results, such as the securing of a dislocation of the sternal end of a clavicle with wire sutures. Nothing is said in that report about dinner dress, cocktails and the dinner which soon became the usual environment for annual meetings—which in those circumstances are really enjoyable. For many years Forsyth went on talking about infantile diarrhœa, Jeff Wood often presented rarities, and Kent Hughes used to run in unprogrammed exhibits of old patients with pleasing results. At the following meeting, held on March 24, 1908, Kent Hughes delivered a lantern lecture on the ætiology and pathology of *talipes equino-varus*, emphasizing the point which he frequently stressed, that the only bones involved in the deformity were the astragalus and the *os calcis*. Stephens followed with a demonstration of Lovett's lateral traction without long axis traction for advanced structural scoliosis, and showed the Bradford frame of gas piping on which lateral traction was performed, using strong webbing with felt protection and fixation by means of plaster of Paris. At the April meeting, Cole showed a boy with a huge cystic hygroma of the neck, and Forsyth a boy with megacolon. A series of cases of *poliomyelitis acuta* followed and there ensued one of many animated discussions in which "Bricky" MacKenzie and Kent Hughes failed to see eye to eye.

I feel sure that you will forgive me if I stop giving details of our meetings, for we have had about ten of them a year for fifty years. What I have said serves to indicate the pattern—a monthly meeting, usually on the second Wednesday, in the evening, in the Board Room at the Children's Hospital, in the presence of children with something to be seen or felt, available for examination by anyone interested, and then banished while the responsible doctor gave the case history with comments on points of interest and, later, discussion open to anyone present. This common pattern was varied by holding symposia and lectures by members or invited visitors, and by pathological or orthopædic demonstrations. We shall let it go at that for the present.

### A Section of Pædiatrics.

Attention will now be directed to a sequel of outstanding importance. At the eighth session of the Australasian Medical Congress held at Melbourne in 1908 there was a Section for Diseases of Children. Jeff Wood and Hobill Cole were the joint secretaries, assisted by a committee consisting of Peter Bennie, Kent Hughes and Alan Mackay. The president was A. Jefferis Turner, of Brisbane, who introduced the subject of lead poisoning of children by white paint on houses subjected to desiccation by hot sunshine. The vice-presidents were Charles Clubbe and A. E. Mills, of Sydney, and A. A. Lendon, of Adelaide. Inquiry into cause and effect between the formation of our Pædiatric Society and the appearance of this pædiatric section in the congress brings out the following points. From 1890 until 1908 there was not a pædiatric section at sessions of congress; in 1890 the average attendance was only six persons—hence the abandonment of the section. The Melbourne Pædiatric Society was born in 1906 and thrived. The eighth session of Congress was organized in Melbourne. The organization of a section commences at least a year before the actual meeting. The committee and the secretariat consisted of the senior founders of our Pædiatric Society, who honoured distinguished visitors in normal fashion with the presidential offices.

In the fortieth annual report (1908-1909) of the Children's Hospital we find the following interesting statements:

> The members of the Australasian Medical Congress which was held in Melbourne, October 19 to 26, 1908, were deeply interested in this Hospital. It was anticipated that about twenty visitors might be in attendance daily, but this number was far exceeded; on one occasion sixty-five were present, and the interest in the Children's Section was so keen that even after Congress had terminated visiting doctors continued to attend.

The Section for Diseases of Children had a membership of sixty in the Congress. Since then there has not been a session without a strong pædiatric section in it.

### Extramural Members and Expansion.

Adverting to the early days of our Society, we notice that T. E. Green, of Bendigo, attended numerous meetings and on more than one occasion he figured in the programme; it is of passing interest that he was the first to describe pyloric spasm as distinct from hypertrophic pyloric stenosis. A. E. Mills came from Sydney to open a fascinating symposium on artificial feeding of infants; the discussion at that meeting reflects the views on the subject when boiled milk was regarded as ruined and percentage feeding was in its infancy. Green and Mills are named as forerunners of many participants in our activities who were not associated with the work at the Children's Hospital. In after years expansion took place to include pædiatricians practising in State departments, at other hospitals in Melbourne, and in provincial centres throughout Victoria.

This expansion was the result of deliberate planning. Though membership of the committee was almost a sinecure for many years, matters of principle and of policy were discussed by Harry Stephens for eighteen years, or Jock Grieve for twenty-four years, with other committee members by telephone or at chance encounters; formal meetings were seldom held. Similarly they conferred with the resident assistant secretary, who for many years was the senior resident medical officer or the medical superintendent, about the arranging of programmes and the staging of meetings. We depended heavily upon our honorary secretaries, and though this method of administration may sound rather inept, it served to keep the Society functioning smoothly and effectively. Many of our meetings have been held elsewhere than at the Children's Hospital. Members such as Walter Summons, Frank Scholes, Frank Norris, Cecil Colville, Vera Scantlebury Brown, Kate Campbell, Guy Springthorpe, Harry McLorinan, Ian Jeffreys Wood, Keith Hallam, Charles Richardson, Murray Tallent and Gerry Weigall have made the Society much more than a clinical adjunct of the Royal Children's Hospital.

### Relations with the British Medical Association.

The relationship of the Pædiatric Society with the Victorian members of the British Medical Association requires a little discussion and explanation. Our Society is not formally affiliated with the Association, nor is it a special section within it. In 1905 Jeff Wood was the president of the Medical Society of Victoria, and he played a prominent part in the successful negotiations for the fusion of the Medical Society and the Victorian Branch of the British Medical Association to form our present organization, the British Medical Association (Victorian Branch), which commenced operations in 1907. At a meeting of the committee of the Medical Society of Victoria in 1906, Harry Stephens reported the formation of the Melbourne Pædiatric Society and received felicitous approval. In subsequent years rules were made for special sections within the British Medical Association and for affiliations with other medical organizations. The matter of linkage with the parent body has come up for consideration on several occasions, but each time those in favour of *laissez-faire* have predominated. It does not matter, for any member of the British Medical Association may join us as a visitor or as a member. On May 19, 1915, a conjoint meeting of the Pædiatric Society of Victoria and the Victorian Branch of the British Medical Association was held. Since that first one many conjoint meetings have been arranged between the two organizations, and it has become customary for other hospital clinical societies to provide similar facilities for the members of the British Medical Association. We are grateful to the editors of the *Intercolonial Medical Journal of Australasia* and its successors, the *Australian Medical Journal* and THE MEDICAL JOURNAL OF AUSTRALIA; they have been generous with space for reports of our meetings. The early reports seem to have emanated from Harry Stephens and Hume Turnbull, but Reg Webster did the reporting in his inimitable manner for many years, and his successors have tried to follow the standard he set. Thus, without affiliation or formal integration with the British Medical Association, our Society has served to interest and to educate many people other than those who have attended our meetings.

### Footprints on the Parade Ground.

Again I have the urge to divulge the second reason for my subterfuge, but perhaps first we had better scamper over the parade ground to see what further footprints we can find.

As we enter it we can pick up some trails that go all the way through, others that go a long way or a short way, and still others that are found further in or even towards the end of the parade ground. All the longer trails have detectable alterations in the footprints as earlier people drop out and others replace them. Sometimes the trails and the imprints about them are inextricably intermingled, and they criss-cross here and there.

An early trail is that of congenital frailty, or specific disease, or hereditary taint, or venereal disease, or straight-out syphilis. "Know your syphilis and you know your medicine" was hammered in alike by Jonathan Hutchinson in England and by our own Harry Allen. Peter Bennie and his colleagues blamed it for almost everything from marasmus to chronic bronchitis; one out of every three or four children had it; dish out the "hyd. cum crete", pour out the "pot iod.", rub in the mercury! Then Hiller brought to Melbourne the means of serum diagnosis and arsenical treatment, and the trail was no longer a rut. Partial reactions were a bugbear before the careful Harrison technique helped to eliminate them. Some senior resident medical officers developed a special clinic near the middle of our period and could claim cures of congenital syphilis by the hundred; their successors reduced the numbers to scores when fewer subjects were offering. A venereal specialist was added to the staff, but with the arsenical and bismuth therapies and later on the antibiotics, congenital syphilis became rare—and the office of the specialist disappeared. Parallel with the conquest of this major scourge, epidemics of gonococcal vulvo-vaginitis, which used to attack whole wards of children, were brought under control, and even single instances of the condition are now but seldom seen.

Tuberculosis is another scourge of childhood. Until very near the end of our parade the generalized variety was inevitably fatal; its recent yielding to therapy is a signal victory. Affections of the bones and joints trail through our field. Peter Bennie, Jeff Wood and Harry Stephens have left prominent footmarks, but there are many others. Kent Hughes was keen on using tuberculin in many guises and insisted on heliotherapy. We pick up the tracks of Whitaker, Colquhoun, Wilfred Forster and others with the coming into being of the Frankston Orthopædic Branch of the hospital; they let in the sunshine, made judicious surgical attacks, and used all the orthopædic stunts and the wiles of physiotherapy. Though no longer a scourge, tuberculosis has not by any means been conquered yet. On the trail of glandular and chest tuberculosis there are many tracks made by such as Downes, Southby and Galbraith. But the steady tramp of Reginald Webster shows up the line of march of a great torch bearer; the light that he has thrown on the whole subject has bathed our Society in reflected glory and has been seen from afar.

The trail of alcoholism, poverty and ignorance which sullied our parade ground at first has become less evident. Besotted parents are now less common, babies do not get cirrhosis from whisky, and their cries of hunger and misery are less audible. The nurture and management of infants and children provide a broad track in our pædiatric field, alongside which we can readily find the trails of many workers, from those of Jeff Wood and Richard Stawell, Harry Stephens and Stewart Ferguson, to those of Vera Scantlebury Brown and Kate Campbell, Vernon Collins and Elizabeth Turner, and on to those of John Colebatch and Glyn White, and there are many others.

Another major trail is that of heart disease. The congenital and the acquired varieties were ill defined and sometimes confused. A line through the footprints of Dicky Stawell, Hume Turnbull, Jock Grieve, Clive Fitts, Tom Lowe, Lawrence Stokes and their fellow workers has mapped out more surely the trail of acquired heart disease, which has diverged considerably from that of congenital anomalies of the heart and great vessels. This latter trail is marked by many impressions, of which the more recent

ones are discernible as those of Mostyn Powell, Alec Venables, Harry Hiller and Russell Howard, all of whom have made notable contributions. On the nearby track of nephritis the conspicuous prints are those of Jock Grieve and Robert Southby.

We cannot miss the long, long trail of poliomyelitis, which Jean Macnamara took over valiantly from Kent Hughes, Colin MacKenzie and Harry Stephens. In this work Jean has been associated with swarms of physiotherapists, social workers and fellow "orthopods" such as Eric Price, John Colquhoun, Wilfred Forster and Elizabeth McComas, at Hampton and at Frankston, and with experts like Frank Scholes and Harry McLorinan at Fairfield, and organizers such as "Bill" Upjohn, John Dale, Frank Norris and Robert Southby. Old tracks are disappearing; but a bright new one has recently appeared. It is the path of those like Bazeley who have introduced prophylactic immunization, which may change the whole trend on this trail. Naturally, in this era of preventive medicine there have been successes on other trails. Walter Summons left a firm mark by pushing the use of antitoxic serum for diphtheria; but no one has been more insistent than Alfred Derham on the need for us to advocate and practise immunization against diphtheria, pertussis, tetanus and any other disease which can be attacked in this way. Stanley Williams and Robert Southby have also been leaders in this field. They have followed in tracks started by pioneers such as Syd Patterson and Grantley Morgan, who used to be of our number. They and others have also helped on the trail of treatment with sera, vaccines and antibiotics, which has yielded rich rewards.

When we come to consider the territory of the metabolic diseases, we think first of the blurring of the formidable ruts of scurvy and rickets made by the footmarks of everybody about the place in the early years. During the first twenty years of our period, application of the knowledge of vitamins and causes almost eradicated these conditions, the occurrence of which locally is now accidental. We can recall that Douglas Galbraith arrived in our midst from Glasgow with a thesis on rickets in his hands. The coming of insulin in 1921 similarly metamorphosed juvenile diabetes, which hitherto had been inevitably fatal and since has become manageable. In this trail Geraldine Amies has left her marks. Right across our parade ground is the track of the sleuths of pink disease, from Jeff Wood and Hobill Cole to Robert Southby and Howard Williams and their collaborators; but the end is not yet in sight. Charlotte Anderson has distinguished herself and us by the progress she has made in our knowledge of conditions such as the cœliac syndrome and fibrocystic disease of the pancreas; that trail bears earlier the imprints of Stewart Ferguson, Jock Grieve and many others.

Another rush allows us a glimpse of the trails of experts in blood states. From 1920 onwards, Upjohn and Littlejohn established the value of transfusions of whole citrated blood and of infusions of saline and glucose solutions. We come on to the modern highway leading to better medicine and surgery through studies of body fluids and blood chemistry. There we see the footprints of Howard Williams, Bill MacDonald and the research team. Another trail follows progress with blood diseases, alongside which we find the footprints of Reg Webster and Stewart Cowen leading on to those of John Celebatch, John Perry and Alan Williams.

The surgeons who have become proficient in the operative procedures peculiar to childhood have also produced many footprints. We can identify Hamilton Russell on the trails of hernia, harelip and cleft palate. Harry Stephens has left his mark on the harelip and cleft palate trail and elsewhere. Murray Clarke has pursued the interest in hernias and uro-genital deformities. Russell Howard and young Douglas Stephens have made advances in this type of work. Plastic surgeons led by Rank and Wakefield have entered the field and have marked some of the lines as their own.

The behaviour problems of children form an avenue in which the impressions of many are intermingled. Problems arising from inherent mental inferiority introduce us early to Jeff Wood and on to Jock Grieve and others. Latterly Glyn White can be identified on the trail of cerebral palsy and other spastic states. The heterogeneous remainder has for many years been the province of John F. Williams and his team of helpers, medical and lay, who sort them out, investigate, observe and treat them by the use of many skills and accomplishments. A whole psychiatric department has grown for this work, which has recently been taken over by W. S. Rickards, whose mark was already on the trail.

Tracks of non-tuberculous chest conditions extend from one end of the ground to the other. That of bronchiectasis has been followed by many people, from David Embelton, Bill McLaren and Byron Stanton to Howard Williams and his team of experts. Bronchoscopists such as Ray Hennessy have helped in this and many other places; and so have the radiologists. The perplexing trail of allergy and asthma has on it the marks of many; but those of David Embelton and Mona Blanch show out.

The parade ground is too extensive for more protracted inspection on this occasion. We cannot leave it, however, without a note about the footprints of some of our investigators—pathological, radiological, biochemical, serological, virological, specialist and clinical. We cannot miss the marks left by Hewlett and Stephens, Reg Webster and Colin Macdonald, Stewart Cowen and Clive Fitts, Jean Macnamara and Kate Campbell, Howard Williams and Charlotte Anderson, John Perry and Alan Williams; and there are many others too numerous to particularize. The recent marks are very prominent, and that bodes well for the future.

## Conclusion.

The game is up. My second reason is revealed. I just cannot treat the subject historically as I was asked to do. Subjective bias intervened. The material became nondisparate, pultaceous and monotonous. Apart from the march of progress, which has been shared with all other groups of the medical profession, the middle of our story is like the beginning, and the end is a mere prolongation of it. Without imagery and attempted ornamentation, this meeting might have conformed to the horror of the humdrum contact of the borer with the bored. I have done what I could to escape that situation today.

## Appendix.

*Presidents of the Melbourne Pædiatric Society.*

| | | | |
|---|---|---|---|
| 1906 | Charles Ryan. | 1930 | Douglas Galbraith. |
| 1907 | Peter Bennie. | 1931 | David Embelton. |
| 1908 | A. Jeffreys Wood. | 1932 | Reginald Webster. |
| 1909 | F. Hobill Cole. | 1933 | F. Kingsley Norris. |
| 1910 | E. Alan Mackay. | 1934 | H. C. Colville. |
| 1911 | Richard Stawell. | 1935 | J. G. Whitaker. |
| 1912 | W. Atkinson Wood. | 1936 | Charles Osborn. |
| 1913 | W. Kent Hughes. | 1937 | Robert Southby. |
| 1914 | David M. Officer. | 1938 | Colin Macdonald. |
| 1915 | H. M. Hewlett. | 1939 | D. Officer Brown. |
| 1916 | Charles Perry. | 1940 | H. Douglas Stephens. |
| 1917 | No record. | 1941 | H. L. Stokes. |
| 1918 | No record. | 1942 | H. L. Stokes. |
| 1919 | Stewart Ferguson. | 1943 | Wilfred Forster. |
| 1920 | A. E. Rowden White. | 1944 | A. B. McCutcheon. |
| 1921 | H. Hume Turnbull. | 1945 | Eric Price. |
| 1922 | R. L. Forsyth. | 1946 | A. P. Derham. |
| 1923 | R. M. Downes. | 1947 | J. B. Colquhoun. |
| 1924 | W. G. D. Upjohn. | 1948 | Mostyn Powell. |
| 1925 | Lionel Hood. | 1949 | Kate Campbell. |
| 1926 | A. P. Derham. | 1950 | Stanley Williams. |
| 1927 | W. W. McLaren. | 1951 | Russell Howard. |
| 1928 | H. Douglas Stephens. | 1952 | R. V. Hennessy. |
| 1929 | H. Boyd Graham. | 1953 | H. McLorinan. |

*Presidents of the Pædiatric Society of Victoria*

| | | | |
|---|---|---|---|
| 1954 | Vernon Collins. | 1956 | John F. Williams. |
| 1955 | Arthur Day. | | |

# JAUNDICE OF PREMATURITY.[1]

By KATE CAMPBELL,
*Melbourne.*

THE increasing attention directed to the newborn has inevitably led to interest in one of the commonest symptoms seen at this period—viz., jaundice. The neonatal period is a critical time when all organs are becoming adapted to the new extrauterine existence, and in this general functional immaturity the liver shares.

Clinically, neonatal jaundice can be usefully divided into two main groups, as follows: (i) jaundice from inadequate liver function, due either to faults in the liver or to too heavy a load on a normal liver; (ii) jaundice from mechanical obstruction.

The factors involved in inadequate liver function may be set out as follows:

1. Physiological jaundice in the newborn.
2. Prematurity.
3. Excess bilirubin: excessive hæmolysis, excessive bruising, excess blood from the placenta.
4. Hypoxæmia, intrauterine or extrauterine.
5. Infection: hepatic (also element of obstruction) or extrahepatic.
6. Congenital metabolic disorders: galactosæmia, familial non-hæmolytic jaundice with kernicterus (Crigler-Najjar's disease).

The types of mechanical obstruction are as follows: (i) congenital obstruction of the bile passages; (ii) the inspissated bile syndrome; (iii) neonatal hepatitis (also an element of inadequate liver function).

My part in this symposium is to consider the jaundice of prematurity. It is well appreciated that all newborn infants have impairment of liver function, and the immaturity of the premature liver exaggerates this. The bilirubin is derived from hæmoglobin breakdown and is therefore of the indirect reacting type. In newborn infants severe jaundice of this type may produce cerebral damage—*i.e.*, kernicterus—irrespective of the cause of the jaundice. Jaundice of prematurity is a disease *per se*, and is distinct from blood group incompatibility. Because of its potential danger in producing kernicterus, the jaundice of prematurity is an important condition. Generally speaking, the two main causes of death in prematurity are atelectasis up to three days and the kernicterus of jaundice from the fourth to the eighth day. The better the results in preventing and curing atelectasis, the more infants will survive into the later days to be at risk from kernicterus.

It is now generally accepted that the cause of kernicterus is the effect of indirect-reacting bilirubin on the central nervous system neurons, the direct-reacting bilirubin being harmless in this respect. The exact mechanism is not yet fully worked out, but it appears that it interferes with the oxygen uptake by the cells. The serum bilirubin content of the cord is less in the premature than in the full-time infant (average 1·3 as against 2·1 milligrammes per 100 millilitres—Gellis and Hsia, 1955), but thereafter it rises more rapidly in the premature infant, being much higher by 48 hours, and in infants weighing under four pounds six ounces (2000 grammes) it is continuing to rise by the sixth day.

The natural history of a case of kernicterus is as follows. Jaundice appears early, usually within 24 to 36 hours of birth, and deepens progressively, being usually marked by the fourth day and increasing rapidly thereafter. Patches of bile staining appear on the napkin, like bull's eyes. The infant then begins to show loss of vigour and impaired appetite. He begins to vomit, at first milky material, which later becomes bile-stained. He will then show signs of central nervous system involvement. Sometimes there will be mouthing movements. Some infants are restless and irritable, crying a great deal. Others become lethargic and apathetic, with marked hypotonia, lying like rag dolls on their beds. Others show increased muscle tone. Spasms of outward deviation of the eyes occur ("the eyes doing the splits"), and the baby's gaze becomes vacant. About this time he will show sudden starts like a spontaneous Moro reflex. The infant looks suddenly frightened and cries. There is outward deviation of the eyes with extension of the limbs. Then he develops a frown and begins to have head retraction and spasticity. Cyanotic attacks and persistent vomiting follow. Death is usually preceded by pulmonary œdema. Death occurs usually between the fourth and ninth days, the peak incidence being on about the sixth and seventh days. Occasionally it may be deferred until the eleventh day. Generally, the more premature the infant, the earlier the onset, and the earlier the day of death. If the baby survives, he invariably shows some sequelæ in the central nervous system.

In my experience, once a premature infant develops signs of central nervous system involvement, the damage is irreversible and sequelæ are inevitable. Treatment may preserve life, but it will not undo damage to the central nervous system. It follows, therefore, that we must prevent the occurrence of kernicterus. To effect this, two things are necessary: first, we must know what are the predisposing factors to the disease so that these may be prevented or treated; secondly, we must be able to foretell when kernicterus is threatening—*i.e.*, we must be able to recognize the pre-kernicteric phase and give treatment to prevent the onset of kernicterus. This is the whole crux of the matter.

### Conditions Predisposing to Kernicterus.

The following are conditions favouring the development of kernicterus: (i) hypoxæmia, intrauterine or extrauterine; (ii) excess blood from the placenta; (iii) marked bruising in vascular regions; (iv) dehydration; (v) excessive vitamin *K* administration; (vi) infection; (vii) twin birth.

#### *Hypoxæmia.*

Hypoxæmia, either before or after birth, may be caused in various ways. The commonest intrauterine cause is retroplacental hæmorrhage, and the most common extrauterine cause is atlectasis. The hypoxæmia acts in three different ways: (i) on the liver cells, lowering their functional efficiency; (ii) on the capillary walls in the brain, as elsewhere, causing spoiling; (iii) on the central nervous system neurons. It is probably the two last effects which impair the blood-brain barrier and make the neurons more vulnerable to the bilirubin in the bloodstream. Every effort is directed, therefore, to preventing oxygen lack of the fœtus during labour, and to giving adequate oxygen therapy when necessary after birth.

#### *Excess Blood from the Placenta.*

The earlier the gestation, the larger is the placenta relative to the weight of the baby, and therefore the greater the proportion of blood in the placenta relative to the amount in the fœtus. At term it is about 1:3. The more blood the premature infant receives, the more will be destroyed, and the greater the load of bilirubin brought to the immature liver for excretion. Therefore, the higher the serum bilirubin level will be.

The premature infant may receive extraplacental blood in the following two ways: (i) From the use of ergometrine at birth. If this is given before the separation of the placenta, the powerful, unnatural contraction produced sends an abnormally large amount of blood into the baby. We therefore defer the administration of ergometrine until after the placenta has separated. (ii) By late clamping of the cord. We do not wait for the cord to cease pulsation, but clamp it as soon as the upper part of the respiratory tract has been cleared. The cord is not stripped.

[1] Read at the Jubilee Meeting of the Pædiatric Society of Victoria, Melbourne, March 11 to 15, 1957.

*Bruising in Highly Vascular Areas.*

Vascularity favours bruising and also rapid absorption of bilirubin from the area, thus producing a rapid rise to a high level. The bruised area also acts as a depot, prolonging the period of jaundice. The two dangerous areas are the anterior portion of the scalp, which is bruised in persistent occipito-posterior presentations (so that the baby looks like a "black cap pudding"), and the soft tissues of the face in face presentations.

*Dehydration.*

Dehydration, by reducing the blood volume, increases the concentration of the serum bilirubin. Once the premature infant loses his œdema, usually by the third day, his hydration must be watched.

*Excessive Vitamin K.*

Excessive vitamin *K* administration has now been incriminated as a factor in producing hyperbilirubinæmia. An injection of 0·5 to 1·0 milligramme is sufficient.

*Infection.*

Infection is an undoubted cause, sometimes in the liver itself as in viral or septic hepatitis, sometimes involving the liver and other organs as in *herpes simplex*, toxoplasmosis and cytomegalic inclusion disease, sometimes elsewhere as in bronchopneumonia or sepsis.

*Twin Births.*

We have found twin births to be a predisposing cause, and in our experience it is usually the smaller twin, not the second one, who has been affected. It is of interest to note that in the recent U.S.A. investigation into retrolental fibroplasia (Everett, 1956), it was found that twinning predisposed to this condition with regard to both incidence and severity. It has been suggested that twins are more hypoxæmic *in utero* than singletons.

## Recognition of the Pre-Kernicteric Phase.

Recognition of the pre-kernicteric phase is crucial. If it is missed, the time for preventive measures has passed. I would say that it is possible in every case to recognize this phase, which lasts several hours. Its recognition depends on two things—the serum bilirubin levels and the clinical signs. When jaundice is marked, the serum bilirubin level is estimated daily or, if indicated, twice daily.

There is also no definite guide as to what is the pathological level of serum bilirubin producing kernicterus. McLean (1955), in infants weighing under three and half pounds, found kernicterus occurring at serum bilirubin levels of 12·6 and 15·2 milligrammes per 100 millilitres, and this has been also our experience. It has been pointed out that a sudden fall in the serum bilirubin level may be found before death. The more premature the infant, the lower the critical level. There is an inverse correlation of kernicterus with gestational age. In a retrospective survey, Crosse *et alii* (1955) found the critical level in 60 premature infants with kernicterus to be 18 milligrammes per 100 millilitres; 60% of the infants with levels above this developed the condition. This figure has been adopted as the critical level by most workers.

As the serum bilirubin level at which kernicterus occurs varies from infant to infant, it is obvious that there is another potent factor—*i.e.*, the invasibility and, therefore, the vulnerability of the neurons.

There is a saying that "all the water of the seven seas cannot sink a ship unless it gets inside". And so, to a certain extent, it appears to be with the rising yellow tide of bilirubin. It would appear that the important factor affecting the vulnerability of the neuron is its state of oxygenation. Stempfel (1955), in full-term infants with fœtal erythroblastosis, found no correlation between the bilirubin level in the blood and in the cerebro-spinal fluid, but a positive correlation between the protein content of the cerebro-spinal fluid and its level of bilirubin. I would think that this indicates that the higher protein content was the result of hypoxæmia, which increased the permeability of the blood-brain barrier.

How are we to detect those infants with neurons vulnerable to a raised serum bilirubin level? The presence of a predisposing factor increases the possibility of kernicterus, and the answer is in the clinical evidence in the baby. It is sometimes stated that kernicterus develops suddenly, but I think that if one watches the baby closely and frequently there is always a warning period of several hours. Adequate treatment in this phase will prevent the onset of kernicterus, and therefore its detection imposes a great responsibility on the clinician.

The clinical signs in approximate chronological order are as follows: (i) First there is a loss of vigour. Activity decreases and the movements are feebler, but the infant is not yet really lethargic. The nurses will comment: "He is not the baby he was yesterday." (ii) Then follows loss of appetite, so that both the bottle-fed and gavage-fed infants refuse to finish feedings. (iii) Then, as the condition progresses, there will be occasional vomiting of milky material, later becoming more frequent. (iv) Later, the vomitus becomes bile-stained, and the baby is then in grave danger of kernicterus (provided, of course, that there is no other cause of vomiting of bile-stained material, such as intestinal obstruction or hypokalæmia).

In the presence of all these symptoms an exchange transfusion is performed. If some symptoms are present and the serum bilirubin content is over 18 milligrammes per 100 millilitres, we also perform an exchange transfusion. The decision is more a clinical than a laboratory one. We aim to exchange 100 millilitres per pound of the baby's body weight, using five-millilitre replacements. The total amount exchanged depends on the baby's tolerance. The exchange transfusion is done via the umbilical vein, and we have used this up to and including the seventh day. If the saphenous vein route is used, it is difficult to make bleeding occur, owing to the small size of the vein. The serum bilirubin content is estimated 24 hours after the exchange transfusion, and daily thereafter until it falls below 18 milligrammes per 100 millilitres. If it remains high, the exchange transfusion is repeated. The hydration is watched and, if vomiting continues, intravenous drip therapy is instituted. The feeding best tolerated is sweetened condensed milk, and vitamin *C* is given to help retention of amino acids.

Can we leave infants with serum bilirubin levels over 18 milligrammes per 100 millilitres without exchange transfusions? We have left infants of four pounds and over who have continued active and vigorous, taking their feedings well and have been quite free of pre-kernicterus signs. We have watched them very closely and have given fluid by the subcutaneous drip method, over and above their theoretcal requirements for their age. We have also given them cortisone, three milligrammes per pound per day. These babies have lost their jaundice and showed no evidence of central nervous system signs. We shall need to follow them for some years before we can say dogmatically that they are unscathed. With regard to cortisone and "Prednisolone", we have been struck by the sudden disappearance of jaundice in two babies of diabetic mothers, but in others the results have not been impressive. This is in line with the results obtained by overseas workers, who used much larger dosage. When there is the double burden of fœtal erythroblastosis and prematurity I have found that infants usually need three exchange transfusions.

## Results.

Usually infants born outside the hospital and admitted have a higher mortality and morbidity from all causes than those born in the hospital. I believe that these are a real test, and I have therefore taken the figures for 1955-1956 from the Queen Victoria Hospital, as the premature ward at this hospital receives infants born in the hospital and also babies transferred from outside.

*Hospital Babies.*

In the hospital 278 premature infants were born, and there were no cases of uncomplicated kernicterus. One infant died of complicated kernicterus.

This was a baby born at 28 weeks' gestation, weighing two pounds twelve ounces. He had a prolapsed cord, the presentation was by the face, and the infant died at the end of the fourth day. The serum bilirubin content was 17 milligrammes per 100 millilitres. On the third day he had pneumonia and cerebral œdema. Exchange transfusion was attempted, but had to be abandoned after 30 millilitres had been exchanged. Post-mortem examination showed early kernicterus with faint bile staining of the basal ganglia.

The mortality and incidence of kernicterus were thus 0·36%.

*Outside Babies.*

There were 112 infants admitted who had been born outside the hospital. In this series there were no cases of uncomplicated kernicterus. One infant died of complicated kernicterus.

This infant was born at 28 weeks' gestation, weighing two pounds five ounces, and was admitted on the third day with severe bronchopneumonia. At four days the serum bilirubin content was 12 milligrammes per 100 millilitres. The condition precluded exchange transfusion, and the baby died on the sixth day. Post-mortem examination revealed early kernicterus, the brain-stem and basal ganglia being pale yellow.

The mortality and incidence were thus 0·9%.

**Conclusion.**

We have now almost reached the stage when we can say that the kernicterus of prematurity is preventible, provided no complication is present which precludes the carrying out of the necessary treatment.

**References.**

CROSSE, V. M., MEYER, T. C., and GERRARD, J. W. (1955), "Kernicterus and Prematurity", *Arch. Dis. Childhood*, 30: 501.

GELLIS, S. S., and HSIA, D. Y. (1955), "Jaundice in Infancy", *Pediat. Clin. North America*, May: 449.

KINSEY, V. E. (1956), "Retrolental Fibroplasia", *Arch. Ophth.*, 56: 481.

MACLEAN, J. R., LUCEY, J. K., and HARRIS, R. C. (1955), "Study of Bilirubinæmia of Prematures with Relation to Kernicterus", *Am. J. Dis. Child.*, 90: 573 (abstract).

STEMPFEL, R., and ZETTERSTROM, R. (1955), "Concentration of Bilirubin in Cerebro-Spinal Fluid in Hæmolytic Disease of the Newborn", *Pædiatrics*, 16: 184.

## CHANGING ASPECTS IN PÆDIATRIC ORTHOPÆDICS.[1]

By DOUGLAS GALBRAITH,
*Melbourne.*

THE basis for this talk is an analysis of admissions to the Melbourne Royal Children's Hospital Orthopædic Section at Frankston during the past 26 years. It may sound paradoxical for a pædiatrician to be attempting a survey of orthopædic conditions. My only excuse is that I have been associated in one way or another with the hospital almost since it opened, have known personally many of the patients, and can perhaps view the whole period of 26 years with a certain detachment and, I hope, impartiality. It is emphasized that the analysis is not of children attending the Royal Children's Hospital, but simply of the work of the Orthopædic Section.

In 1927, with considerable courage, the Committee of the Children's Hospital bought 20 acres of ground on the seashore of Mount Eliza, near Frankston, and built the hospital of 88 beds at a total cost, fully equipped, of approximately £92,000. The hospital opened to receive patients on March 3, 1930.

[1]Read at the Jubilee Meeting of the Pædiatric Society of Victoria, Melbourne, March 11 to 15, 1957.

The first residential medical superintendent was Mr. J. B. Colquhoun, F.R.C.S., who is still on our staff as a visiting surgeon. The hospital is fortunate in having had the services of many outstanding surgeons, and the present team of six visiting orthopædic surgeons is, in my opinion, an outstanding one judged by any standard.

The hospital opened with 40 children and has gradually grown to a bed capacity of 100 orthopædic beds and 20 beds for medical conditions, with an additional rehabilitation unit of 20 beds for severely disabled adolescents. It has good facilities for major surgery, and of recent years has averaged approximately 160 major operations and 60 minor operations each year. The hospital was in army occupation for one year during the second World War. During the remaining period of 26 years there have been approximately 3500 admissions. The object of this paper is to present the result of analysing the kind of disabilities for which children have been admitted, and to put forward for consideration certain findings and conclusions arising from such a survey. This can perhaps best be done by a series of questions and answers, as follows.

### Has There Been Any Variation during the Past 26 Years in the Kind of Disability for which Children were Admitted?

An analysis of admissions has been made for each year from March, 1930, to March, 1956, and the total period has been divided in five epochs of five years each. Figures for this last year up to March 1, 1957, have also been compiled. Readmissions have not been counted. Naturally, in the first year there was an expected preponderance of children with bone and joint tuberculosis, osteomyelitis and post-poliomyelitis deformities, since most of the children with these complaints in the care of the Children's Hospital were sent to Frankston. But, as will be seen, this kind of preponderance persisted for some years.

Table I shows the complete analysis of five five-year periods from 1930 to 1956 and for the final period of one year, 1956-1957.

Figure I compares in graphical form the admissions by disease for the same period, 1935-1940, with that of the final period, 1951 to 1956. The second period has been taken rather than the first, because the first period might be criticized as misleading, since it would show the large influx of chronic cases admitted when the hospital opened. The total bed capacity was also smaller in the first five years.

Figure II shows the composite graphs of admissions by disease for the whole period of 25 years.

Now if we study the table and graphs, the following facts are notable: (i) The decline in bone and joint tuberculosis, but also the continuing incidence of tuberculosis in children. (ii) The decline in osteomyelitis, although patients with chronic osteomyelitis are still being admitted. (iii) The increase in admission for congenital deformities, mainly congenital dislocation of the hip and talipes. (iv) The large number of admissions for Perthes's disease in recent years. (v) The increase in admissions for arthritis and particularly for "non-specific" arthritis. (vi) The increase in admissions for scoliosis, mainly for operative treatment.

### Can Any Deduction be Drawn from this Analysis?

I think we can make the following deductions:

1. Since all known cases of bone and joint tuberculosis in children in Victoria have been due to human infection (Webster, 1941), and since the numbers have greatly diminished, the anti-tuberculosis campaign in the State of Victoria is proving effective. There is still the fact, however, that even in the five-year period to 1956, 49 children were admitted to the hospital with bone and joint tuberculosis, together with another 82 children with primary pulmonary tuberculosis, tuberculous meningitis or other forms of tuberculous infection. Even in the past year ending February, 1957, there have been five fresh cases of bone and joint tuberculosis. It is of interest that in the period 1951 to 1956 the percentage of New Australian children admitted was 22 in the case of bone and joint tuberculosis, and 16 in other forms of tuberculosis.

TABLE I.
*Comparison of Admissions, by Disease, from 1930 to 1957.*

| Period. | Tuberculosis. | | Poliomyelitis and Sequelæ. | Disabilities Present at Birth. | Osteomyelitis. | Perthes's Disease. | Arthritis. | | Scoliosis. |
|---|---|---|---|---|---|---|---|---|---|
| | Bone and Joint. | Other. | | | | | Non-Specific. | Other. | |
| 1930 to 1935 .. | 119 | — | 99 | 50 | 14 | 3 | — | 6 | 3 |
| 1935 to 1940 .. | 106 | — | 99 | 58 | 45 | 11 | 4 | 20 | 12 |
| 1940 to 1946 .. | 103 | — | 127 | 27 | 41 | 16 | 2 | 11 | 7 |
| 1946 to 1951 .. | 62 | 49 | 142 | 87 | 25 | 39 | 7 | 41 | 14 |
| 1951 to 1956 .. | 49 | 82 | 159 | 207 | 26 | 104 | 24 | 36 | 46 |
| 1956 to 1957 .. | 5 | 9 | 31 | 39 | 6 | 25 | 13 | 4 | 4 |

2. Chemotherapy is proving effective in dealing with most cases of osteomyelitis. Although this is true, we must not be over-optimistic, since in the five-year period ending March, 1956, 26 children were admitted with chronic osteomyelitis, and in the one year just ended, six children have been admitted with this diagnosis, gross bone destruction occurring in two of them. In one child there was a sequestrum some six inches long of the type seen in the "bad old days" (Figures III and IV), and one patient nearly lost his life from septicæmia. Surgeons may grumble gently at physicians for treating the condition conservatively for too long before invoking surgical opinion.

3. The increase in the number of children admitted with congenital deformities is probably not a true increase, but may be influenced by (*a*) earlier diagnosis and more intensive treatment, (*b*) the fact that reduction in infantile mortality and in deaths from infection has permitted the survival of many children with severe congenital deformities who might otherwise have died, and (*c*) the availability of more beds. At any rate, there is no doubt that many children are each year admitted to the hospital with some congenital defect.

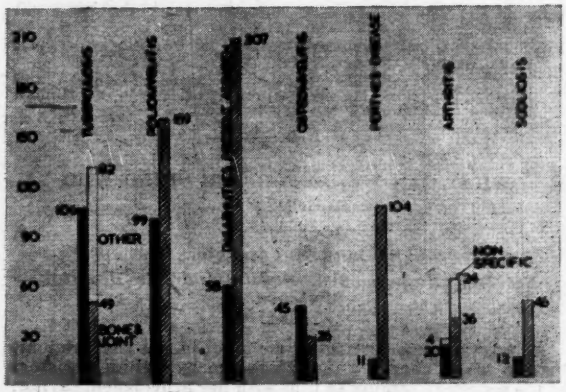


FIGURE I.
Comparison of five-year period 1935-1940 with the five-year period 1951-1956. Solid columns, period 1935-1940; hatched columns, period 1951-1956.

4. There is now a better differentiation of the condition labelled "arthritis". Even though we are still woefully ignorant of the ætiology of many arthritic conditions in childhood, there is now a serious attempt to seek ætiological factors.

5. The treatment of scoliosis has been more vigorous in the past five years. Whether the scoliosis is structural or paralytic in origin, there is no doubt that children and adolescents with this severe disability are getting a better deal. With good assessment, even "bad risk" patients are able to undergo the Risser jacket technique; and modern anæsthesia and resuscitation have permitted spinal bone grafting to be carried out on children in whom previously this would have been regarded as impossible. Considerable credit for this work must go to Mr. Eric Price who, with patient and meticulous care, has done much for these young people. Spinal bone grafts have been carried out now on 27 children in the hospital, all suffering from severe disability, with only one fatal result.

6. Perthes's disease either is becoming more frequent or is being better diagnosed. However, it may be that children are now being treated in hospital who were previously treated as ambulatory out-patients.

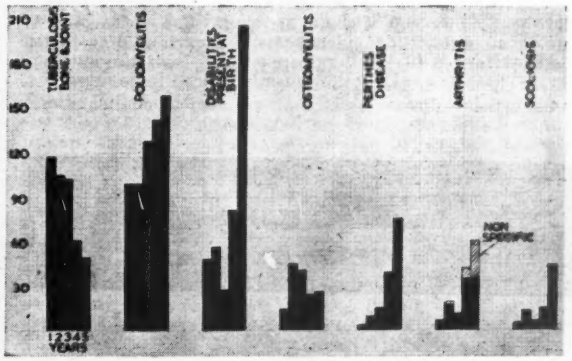


FIGURE II.
Comparisons, by disease, of admissions in five periods of five years each from 1930 to 1956.

### What Investigations are Indicated from this Survey?

1. "Follow-up" surveys are required. There would be great advantage in tracing many of these groups of children so that the end results of treatment could be assessed.

2. There is scope for investigating factors associated with congenital deformities. Dr. David Pitt (1957) at the Royal Children's Hospital and the Royal Women's Hospital has recently reported on a survey relating to rubella, and Dr. Glyn White at the same two hospitals is investigating factors operating in cerebral palsy. At the Walter and Eliza Hall Institute of Medical Research, genetics has been brought into the research unit and a study of twins is in progress. We know that certain congenital deformities can be experimentally produced in animals by mechanical means—for example, "congenital" dislocation of the hip by injecting oxygen into the developing chick ovum—and that cleft palate can be produced by maternal dietetic deficiencies or by cortisone. We may, therefore, feel optimistic that one day we may really be able to do something about conditions which we have accepted as fortuitous and inevitable. For those who do not already know them, I

would recommend the publications in this field of the American Association of the Aid to the Crippled (1953, 1954).

Gradually, I think, we are beginning to understand a little more about the causation of congenital deformities and of cerebral palsy, and I am optimistic that the next ten years will produce a spectacular advance in our knowledge and in our methods of prevention.

3. The still undifferentiated arthritides in childhood and in particular the so-called non-specific arthritis, call for investigation. In the Orthopædic Section we are trying to do something about this condition, which has many elusive factors. It seems to be accepted that this disease is

FIGURE III.

more commonly met with in Australia than abroad. Is it due to an unidentified virus? Is it a variant of collagen disease? Is it a toxic allergic reaction? Does the ætiology vary? These and many other questions need to be answered.

4. Perthes's disease is still an ætiological challenge.

FIGURE IV.

### What is the Future of a Large Orthopædic Hospital for Children?

Our experience is that the demand for orthopædic beds for children is lessening. This trend has been so marked in Britain that many of these beds are now devoted to other purposes. It seems clear that tuberculosis and osteomyelitis are on the wane. As poliomyelitis comes under control, as I am sure it will, a large number of beds will be freed, because, as we have seen, the treatment of poliomyelitis and its after results has been one of the main functions of the Orthopædic Section.

Then again, with a properly organized scheme of "home-help" such as an organization like Red Cross could provide, many children at present admitted to hospital for long-stay treatment could be looked after at home. Many children with Perthes's disease and congenital dislocation of the hip come within this category. It seems to me, too, that if after-care clinics on the British pattern, and similar to those established in Victoria for poliomyelitis, could be set up in suburban and country centres, many children would be saved long journeys to central hospitals and could be well cared for in their own district. I strongly believe that young children should not be admitted to a long-stay hospital if it is at all avoidable, and that if they have to be admitted, they should go home as soon as possible. Therefore, in my view, the present bed capacity for orthopædic conditions could be steadily reduced.

If this is so, and since it is uneconomical to run a hospital well below its bed capacity, how could the remaining beds be best used? This could be a matter for very productive discussion, and while I do not propose any answer, certain thoughts present themselves:

1. The unit could become a general orthopædic unit with an adolescent section up to 18 or 19 years, or even an adult section. This has been the general trend in similar hospitals in Britain.

2. General surgical patients, including children with post-operative conditions, could be admitted.

3. Special surgical patients, such as those who have undergone plastic or thoracic surgery, could be transferred from the parent hospital.

4. An "acute section" could be formed for the admission of certain medical, and possibly surgical, patients from surrounding districts, so that children living in the area need not always be taken to the parent hospital. This would be along the lines of the recommendation by the Pædiatric Committee of the Royal College of Physicians in 1946, which *inter alia*, stated that "a long term hospital should have an acute section for the admission of children from the surrounding area".

Since I myself have not a great deal of time in office left to me and will take no part in such developments, I can be dispassionate in outlining these possibilities. This is a problem concerning those who administer similar hospitals in many parts of the world, and is one calling for intelligent, constructive and imaginative thought.

### References.


AMERICAN ASSOCIATION FOR THE AID OF CRIPPLED CHILDREN (1953), "Prematurity, Congenital Malformation and Birth Injury", New York.

AMERICAN ASSOCIATION FOR THE AID OF CRIPPLED CHILDREN (1954), "Mechanics of Congenital Malformation", New York.

PITT, D. (1957), "Congenital Malformations and Maternal Rubella", M. J. AUSTRALIA, 1: 233.

ROYAL COLLEGE OF PHYSICIANS, PÆDIATRIC COMMITTEE (1946), Final Report (October, 1946): 7.

WEBSTER, R. (1941), "The Relative Incidence of Human and Bovine Types of Mycobacterium Tuberculosis in Human Disease in Victoria", M. J. AUSTRALIA, 2: 49.


## "WHAT CAN WE DO FOR THE CHILD WHO BLEEDS?"[1]


By JOHN H. COLEBATCH,

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A DISTINGUISHED British physician opened a post-graduate lecture in Melbourne a few years ago by telling the story of his secretary coming to him with her arms laden, saying: "It's bursting again, Sir." He asked "What's bursting?" and she answered, "You know. This file of your clinical mistakes." I would not claim to possess the same high degree of clinical honesty—I certainly do not keep such a telling file myself; but there is one early mistake I shall not forget.

A decade ago the anxious parents of a hæmophilic toddler consulted me as to whether he should be circumcised, as had been recommended. I tried to retract the foreskin, cautiously, though apparently with sufficient vigour to rupture some of the normal epithelial adhesions. The result was a large hæmatoma with paraphimosis. Consequently surgery and blood transfusion became inevitable.

Even this minor trauma associated with the retraction should have been avoided in a condition as serious as hæmophilia, and I was not then aware that the prepuce is non-retractile in almost 50% of normal boys at that age. Other practitioners also have their problems with bleeding children, as three further cases will illustrate.

In a provincial centre, a child with purpura and epistaxes of increasing severity was treated for several weeks as

[1] Read at the Jubilee Meeting of the Pædiatric Society of Victoria, Melbourne, March 11 to 15, 1957.

suffering from symptomatic purpura, on the strength of a technician's opinion that the blood was normal. But when he was investigated at the Royal Children's Hospital, Melbourne, he proved to have very severe idiopathic thrombocytopenic purpura, with a strongly positive response to the capillary fragility test and only 600 platelets per cubic millimetre. These abnormalities placed him in grave danger of fatal cerebral hæmorrhage, and the delay in diagnosis might well have cost him his life.

Not long ago a boy known to have Christmas disease arrived at the hospital with such gross leg contractures that he had been quite unable to walk since six months before, when hæmorrhages had occurred into each knee joint. It was stated that for the hæmarthroses the doctor had ordered only rest in bed and the administration of iron.

**Specialist treatment nowadays is less conservative, and is aimed at the prevention of contractures and of chronic arthropathy.**

A problem at the other end of the scale is the case reported to me of a boy with hæmophilia, who grazed his skin on a rock while holidaying. As the abrasion continued to ooze a little, his mother took him to a doctor, and produced a supply of thrombin and of adrenaline which she had brought from Melbourne. To her disappointment the doctor did not apply these measures, but instead he advised interrupting the holiday forthwith by returning 120 miles to Melbourne for specialist treatment. Presumably he felt that the problem was too complicated for him to handle.

**These four episodes, and a number of similar ones that could be quoted (some from within our public hospitals), show up very clearly the deficiencies in our medical training in the management of bleeding. They constitute a challenge to our teachers of physiology and medicine as well as of pædiatrics, both in undergraduate and in post-graduate spheres. This short contribution will, it is hoped, do something to meet that challenge by attempting to cover briefly most of the notable advances in treatment.**

The mechanism of hæmostasis has three components. These are well coordinated and seem to be interdependent to some extent, as may be seen from the following tabulation:

1. Slowing of blood flow in injured vessels produced by (*a*) contraction of arterioles; (*b*) endothelial swelling, etc.; (*c*) pressure of extravascular blood and tissues.
2. Coagulation of blood produced by at least 10 interacting coagulation factors.
3. Adhesion of firm clot to bleeding site produced by adhesive and clot-retracting actions of platelets.

A MODERN THEORY OF COAGULATION.

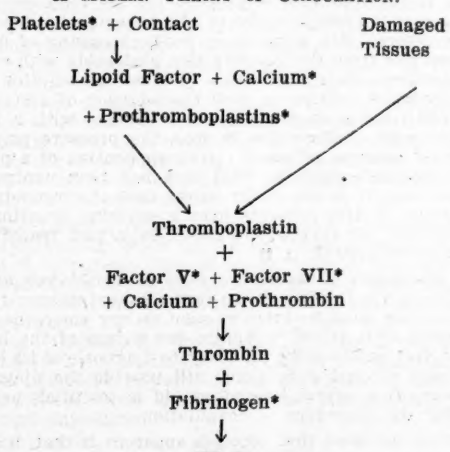


FIGURE I.

A modern theory of coagulation, excluding inhibitors. Asterisks denote substances present normally in blood.

**Promptly there occur constriction and other occlusive changes in the damaged vessels (usually the pre-capillary arterioles), and stasis is further aided by pressure from extravascular blood and from muscle and other tissues. The initial vaso-constriction is maintained for several minutes, during which time the blood both inside and outside the vessel clots to form a fibrin plug that seals the gap. Finally, the action of platelets ensures that the plug remains in the breech and that it becomes firmer by extruding serum.**

**The time-honoured emergency methods for controlling bleeding can act only by assisting this physiological mechanism, not by replacing it. When bleeding demands urgent measures, external pressure and sutures may help for a time by increasing the pressure of the extravascular tissues on the damaged vesels, and dressings may help by reinforcing the clot. But their success can be only temporary if the vessels fail to contract, or if a clot does not form, or if it remains just a gelatinous mass when formed; after a little while the hæmorrhage may recommence and possibly spread into a more vulnerable area—e.g., the throat—with serious results; and prolonged pressure will always lead to necrosis, as does the use of styptics and caustics. So, in thrombocytopenic purpura, in hæmophilia and in certain other diseases, pressure, sutures and dressings should not be used alone for longer than a matter of minutes—not more than five minutes in the case of pressure—and in a vascular disease like scurvy, it is, of course, unwise to use them at all.**

**Thus the first answer to our question, "What can we do for the child who bleeds?", is: avoid harming the child by using the time-honoured emergency measures for too long, and when in doubt avoid using them at all, if this is practicable. If they do not readily control the bleeding, discontinue them and consider the nature and the cause of the bleeding.**

### Diagnosis.

The subject of the diagnosis of the various hæmorrhagic states has been considered at some length in an earlier paper (Colebatch and Wilson, 1956). It was then pointed out that clues to the diagnosis should be sought in the family history, in the previous history and in the story of the current bleeding, as well as from the clinical examination, the capillary fragility or tourniquet test and the battery of laboratory tests that are now available. In this paper reference will be made only to certain aspects of the diagnosis, chiefly to those more closely related to the principles of management.

It is difficult to progress far in making a diagnosis, and in determining the most effective treatment, without an understanding of the mechanisms of hæmostasis, and in particular the mechanism of coagulation itself. It was about the time when this Pædiatric Society of Victoria was being formed that Morawitz first crystallized the views about coagulation by formulating his classical theory. The past half-century has produced an enormous amount of research work on this subject, confirming the classical theory in principle, but expanding it considerably.

A thumbnail sketch of current views on the coagulation of blood may be helpful. The insoluble end-product, fibrin, is known to be formed from plasma fibrinogen through the enzyme-like activity of thrombin (Figure I). To work backwards from this third phase of coagulation: the substance thrombin is formed when plasma prothrombin is acted upon by the enzyme thromboplastin, and this second phase requires the presence of the labile plasma factor V or accelerin, and of the stable serum factor VII or convertin, in addition to calcium. The first phase of coagulation remains the least well understood. It appears that on contact with a "foreign surface", the platelets release a lipoid substance which, in the presence of calcium, acts upon precursor substances or prothromboplastins to form the enzyme thromboplastin. These prothromboplastins in the plasma include the anti-hæmophilic globulin that is lacking in hæmophilia, the PTC factor that is lacking in Christmas disease and probably two or three other similar factors. It is as well to appreciate also that this unimaginably complex process of coagulation, involving about a dozen different factors, is a dynamic one. Once initiated, it proceeds with ever-increasing velocity at the site of bleeding until, with an

almost explosive climax, the clot is formed. The importance of dynamics rather than quantity is shown in some hæmorrhagic states, in which large clots may be formed that are ineffective simply because they are not formed fast enough.

The therapeutic implications of all our knowledge concerning coagulation are numerous. Only a few of them can be mentioned here. "Oxycel" gauze is helpful in possibly all cases of bleeding, because it reinforces the blood clot by forming a coagulum when in contact with any moist tissues, and its capacity for swelling may add a pressure effect to aid hæmostasis further. A glance at Figure I shows that thrombin will be an effective local hæmostatic in all conditions except the rare examples of severe deficiency of fibrinogen. Similarly it can be seen that preparations containing thromboplastin—e.g., Russell viper venom, tiger snake venom, "Clauden", breast milk—will help control bleeding that is caused by lack of platelets, or by lack of prothromboplastins as in the hæmophilias; but they will be quite useless for deficiencies of fibrinogen, of prothrombin, of factor V and of factor VII. With regard to anti-hæmophilic globulin, the knowledge that it is very labile and that it is absent from serum and present in Cohn's plasma protein fraction I explains why hæmophiliacs are not helped at all by serum,[1] or by blood or plasma unless it is fresh, and why Cohn's fraction I is sometimes given. On the other hand, the PTC or Christmas factor is stable, and is present in bank blood, plasma and serum,[1] so patients with Christmas disease will benefit from any of these substances. Calcium is known to be required for the first two and possibly for all three phases of coagulation; but it is well recognized that, except after massive transfusions with citrated blood, the level of ionized calcium in the serum never falls far enough to cause bleeding, so no hæmostatic effect can be produced by administering calcium. Finally, when good laboratory studies fail to detect any coagulation defect, and the bleeding is due to vascular disease, little or no benefit can be expected from the use of any of the coagulant hæmostatics mentioned above, with the possible exception of transfusion of fresh blood.

Clinically it is helpful to group the numerous hæmorrhagic states into (*a*) those due to defects of the clotting mechanism, and (*b*) those due to defects of the vessels and/or of the platelets. The diagnosis of clotting defects will not be discussed here, except to mention one misconception that has caused many errors in the past.

For years the bleeding and clotting times were thought to be reliable guides to the recognition of clotting defects. This is not correct—for one reason, in both tests even minor technical errors tend to produce false normal results; but even with flawless technique the bleeding and clotting times are normal in some cases of defective coagulation.

In the second group of hæmorrhagic states—those in which the bleeding arises from vascular and/or platelet abnormalities—the smaller vessels are unduly fragile or permeable to red blood cells, or they have an impaired capacity to contract. Serotonin produced by the platelets may be responsible for contraction of the vessels, and there is evidence that platelet activity may also be related to other aspects of vascular function. The diagnosis of hæmorrhagic states in this group may be suspected clinically, because the bleeding is often spontaneous, affecting mainly the skin and mucosa, petechiæ being a prominent feature, hæmatomata uncommon and hæmarthroses absent, while evidence of an underlying primary disease is frequently present. (Patients with clotting defects, on the other hand, usually have a history of trauma, however trivial, and they may have hæmatomata or hæmarthroses, but not petechiæ.) In the type of vascular bleeding known as allergic purpura, the diagnosis rests to a considerable extent on the characteristic hæmorrhagic lesions which are nodular, papular or vesicular because of œdema, and which are distributed maximally where venous congestion is greatest, usually on the legs and buttocks.

[1] In Australia, serum prepared for clinical use has usually been double Seitz filtered and has only a low content of Christmas factor.

Investigations to establish a diagnosis of bleeding from vascular or platelet abnormalities include the bleeding time, clot retraction, platelet count and marrow puncture. A prolonged bleeding time usually implies abnormality of the vessels; but we have found the capillary fragility test to be a more sensitive indication of vascular bleeding. The latter test may reveal potential post-operative bleeders more often than the bleeding and clotting times which are so often asked for. Its technique has been described elsewhere (Colebatch and Wilson, 1956). Additional investigations that can be of value in vascular bleeding include the Coombs and other tests for immune bodies, the blood sedimentation rate and capillary microscopy. In only a minority of cases is it necessary to submit the patient with vascular bleeding to the usual range of tests of blood coagulation. Finally, in every case in this group, a careful search should be made for evidence of an underlying primary disease—e.g., infection, malnutrition, uræmia, leuchæmia.

Some idea of the relative frequency with which the various hæmorrhagic states occur can be gained from the results of investigations carried out at the Royal Children's Hospital, Melbourne, since the commencement of the hæmatology clinic in 1953. Of the clotting defects there were 27 examples, excluding the relatively common hypoprothrombinæmia of the newborn. One was a case of congenital fibrinogen deficiency, and in four the investigation has not yet been completed. The remaining 22 belonged to the hæmophilia group—17 with anti-hæmophilic globulin deficiency, four with PTC deficiency or Christmas disease and one with Rosenthal's PTA deficiency. In the same period there were two cases of hereditary thrombasthenia, one of giant hæmangioma with thrombocytopenia, 25 of idiopathic thrombocytopenic purpura and a large unrecorded group of diverse symptomatic purpuras. Thus in our experience hæmorrhagic states due to vascular and/or platelet abnormalities occur more frequently than those due to clotting defects. It is important that this should be appreciated, particularly by those who shoulder the responsibility for the treatment and the prevention of unexpected post-tonsillectomy bleeding and similar problems.

### General Therapeutic Conclusions.

Our first answer to the title question of this paper dealt with the harm that can be caused by the unwise use of the older emergency measures. In the light of what has been discussed since then, we see that the emergency treatment of external bleeding from skin and mucosa should be limited to the following measures: (i) the temporary use of the regional pressure point or of a tourniquet if bleeding is very severe; (ii) washing or gentle sponging of debris and loose clot from the bleeding site, preferably with sterile normal saline; (iii) application of thrombin solution 2000 units per cubic centimetre with the addition of adrenaline (1 in 500), using an atomizer or a syringe with a hypodermic needle (before this is done the pressure point or tourniquet must be released); (iv) application of a pad of sterile "Oxycel" gauze or wool that has been neutralized and moulding it to the cavity in the case of a wound; (v) application of firm pressure over a covering dressing for five minutes. In very severe cases an urgent transfusion may also be needed.

Our discussion of the mechanisms of hæmostasis and of coagulation has further shown that the next answer to the title question must be this: as soon as any emergency has been dealt with, try to recognize the nature of the hæmostatic defect and to make an accurate diagnosis of its cause. Sometimes clinical data alone will provide the diagnosis, but more often expert laboratory aid is essential, particularly for the disorders of coagulation.

The next problem that becomes apparent is that, because the various hæmorrhagic states have diverse pathogenic mechanisms, they must call for differing methods of treatment once any emergency has been dealt with. Thus splenectomy, hormones, platelet transfusions, fibrinogen, Cohn's fractions, thromboplastin and antimetabolites all have a place in certain specific disorders, but they can do incalculable harm if used indiscriminately. A further answer to our title question must therefore be: study the

requirements of the patient in the light of our knowledge of the particular hæmorrhagic disorder from which he is suffering, and endeavour to supply those specific needs.

Of the major hæmorrhagic disorders, the two which cause the greatest number of serious problems in treatment are thrombocytopenic purpura and the hæmophilias with the related para-hæmophilias, including deficiencies of prothrombin, factor V and factor VII. Many noteworthy advances in the management of these have arisen in recent years.

### *The Hæmophilias.*

In the hæmophilia group, sex-linked inheritance is confined to true hæmophilia or anti-hæmophilic globulin deficiency and Christmas disease or PTC deficiency. But of patients with one or other of these two deficiencies, we have found, as Sawers (1956) has reported, that only 50% have a positive family history of such an abnormality. Ignorance of this fact led to many cases of hæmophilia not being diagnosed in the past. In the management of all the hæmophilia group, it has been found that repeated intravenous infusions of the missing factors, whether in the form of blood, plasma or protein fractions, are apt to lead to the development of anticoagulants circulating in the blood. Therefore transfusions must be given sparingly, only if recovery without them seems unlikely. It has already been mentioned that for hæmophiliacs, blood or plasma must be fresh; bank blood and plasma one or two days old are of some value, but larger volumes have to be given. In Christmas disease, old bank blood and plasma and serum are effective. In children every effort must be made to conserve veins by avoiding cutting down on them, though in infants this may well be impracticable.

Immediate admission to hospital is essential when tissue bleeding occurs in the most dangerous sites—into the brain and spinal cord and into the tongue and throat. In the last-mentioned site, the pharynx may become blocked with alarming rapidity. It is advisable for the doctor to travel with the patient in the ambulance, equipped with an anæsthetic airway or an entotracheal tube, and he must remember not to give morphine. Retroperitoneal hæmorrhage is also dangerous, because it is easily misdiagnosed as an acute abdominal emergency. We have had one such case—a hæmophiliac admitted to a surgical ward and submitted to appendicectomy. He recovered; but the procedure is not one to be recommended. Macfarlane (1955) states that "operation is justified only if it is certain the patient will die without it". Transfusion must be given before any surgical procedure, commencing one hour before operation.

Hæmarthroses should cause much less chronic disability in the future than they have done hitherto. Elevation and immobilization of the acutely affected joint and the use of ice packs are sound measures that are still required. However, there is also a place in experienced hands for aspiration of the joint, with a cover of transfusions of blood or plasma. Gentle exercise and physiotherapy should begin as early as a week after the hæmorrhage has ceased. With chronically affected joints, much can be achieved with conservative orthopædic care, physiotherapy and the judicious use of steroids.

The hæmophilias particularly have a profound and an understandable effect on the behaviour of both the patients and their parents. An important part of the management, therefore, is sympathetic advising and education of the parents. Though the local doctor and the specialist must accept most of the responsibility for this, the recently formed Hæmophilia Society is beginning to serve a useful function here, particularly in the field of social welfare. One imminent advance is the provision of facilities for immunizing these children against poliomyelitis by intradermal injections.

### *The Purpuras.*

With regard to idiopathic thrombocytopenic purpura, a study of the ætiology and the treatment is in progress in our hæmatology clinic, but at this stage only tentative opinions can be offered. This disease seems to be a general one, analogous in a number of ways to rheumatic fever and acute nephritis. The history and clinical picture commonly provide evidence of a recent antecedent acute infection, of physical or emotional exhaustion and of allergy, any or all of which may possibly be of ætiological significance. If such factors are effectively controlled, the condition in acute cases does show an undoubted tendency to subside. Steroids in adequate dosage (e.g., cortisone, up to five milligrammes per pound of body weight per day) produce an immediate improvement in the result of the capillary fragility test. In most cases this is accompanied by control of the bleeding, which is followed by a steady rise in the platelet count. However, the beneficial effect of steroids may wear off after a few weeks. Their greatest value therefore is in dealing with the acute emergency, in which the bleeding is associated with increased capillary fragility as well as thrombocytopenia. Rest, sedation and the control of infections will usually assist the patient to a complete recovery, even though in some cases this requires a period of months. Splenectomy, which is valuable in adults, has a much greater relapse rate in children. Also, it has recently been recognized that there is an increased susceptibility to overwhelming infections in patients whose spleen has been removed, especially in the first half of childhood. In two American reports (Gofstein and Gellis, 1956; Smith *et alii*, 1956) almost 30% of splenectomized children subsequently contracted a fulminating infection, which proved fatal in 8% of them. Splenectomy therefore is best reserved for cases in which bleeding in uncontrollable, and for the occasional chronic or recurrent case that resists all other measures. In certain American schools frequent use is being made of platelet-rich plasma, or of more concentrated platelet suspensions, or of reconstituted lyophilized platelet substance. Arrangements are in hand for making such platelet transfusions available in Australia, but their role is a small one, chiefly in aplastic thrombocytopenic states.

Allergic purpura in our experience will almost always respond to rest combined with the control of streptococcal infection. Steroids have little if any place in the treatment of this disorder; their administration does not prevent relapses and it may be followed by hæmaturia. One of the most frequent causes of symptomatic purpura in childhood is acute leuchæmia. In this disease, with the judicious use of steroids, folic acid antagonists and purine antagonists, we have been able to produce worthwhile remissions in 70% to 80% of cases; but the therapeutic régime demands careful hæmatological control, which in infants may be worse than the disease. There are encouraging reports from overseas of two large series totalling 367 patients, of whom 50% survived for 12 months, 10% for two years and a few for longer periods of up to six years (Burchenal, 1956; Farber, 1956). Hereditary thrombasthenia or "pseudohæmophilia" is a less common cause of purpura, in which steroids may be beneficial by controlling the increased capillary fragility that is usually present. A rare cause of purpura with thrombocytopenia is the giant hæmangioma of infancy. In one example in our clinic, the tumour reached tremendous proportions before it was diagnosed by biopsy; but superficial X-ray therapy produced an excellent recovery.

### Summary.

This survey has been designed to show that in answer to the question, "What can we do for the child who bleeds?", we must apply the appropriate parts of the emergency régime described above, avoiding the use of caustics and styptics and of pressure and sutures for too long; next we must try to determine the mechanism of the bleeding and to make an accurate diagnosis of its cause, using to the full all the clinical and laboratory evidence that can be obtained; and finally, we have to study the particular therapeutic needs of the patient's disorder in accordance with all that is now known about it, and to supply those needs in the fullest possible degree.

### References.

BURCHENAL, J. H. (1956), personal communication.

COLEBATCH, J. H., and WILSON, B. M. (1956), "The Diagnosis of Hæmorrhagic States in Childhood", M. J. AUSTRALIA, 1: 226.

FARBER, S. (1956), "The Treatment of Acute Leuæmia", *J. Chron. Dis.*, 3: 455.

GOPSTEIN, R., and GELLIS, S. S. (1956), "Splenectomy in Infancy and Childhood; the Question of Overwhelming Infection following Operation", *Am. J. Dis. Child.*, 91: 566.

MACFARLANE, R. G. (1955), "The Bleeder", *Brit. M. J.*, 1: 1080.

SAWERS, R. (1956), unpublished data.

SMITH, C. H., ERLANDSON, M., SCHULMAN, I., and STERN, G. (1956), "Hazard of Severe Infections in Splenectomized Infants and Children", *Am. J. Dis. Child.*, 92: 507.

## Reviews.

**Pneumo-encephalography.** By E. Graeme Robertson, M.D. (Melb.), F.R.C.P., F.R.A.C.P.; 1957. Oxford: Blackwell Scientific Publications. 10" × 7½", pp. 408, with 209 illustrations. Price: £5 10s.

THIS is a fine and authoritative book on air encephalography by the Melbourne neurologist, E. Graeme Robertson, who deservedly enjoys a high international reputation on the subject. The book is well produced and comprehensive, presenting the results of the author's extensive personal experience of the procedure for over 30 years, during which time he has contributed much original thought and experiment. Parts of this work have already been published in his earlier books "Encephalography" (1941) and "Further Studies in Encephalography" (1946).

The author first describes the anatomical and physical factors concerned with the entry of gas into the ventricles and elsewhere, next practical techniques for filling are detailed, and then the appearances in various conditions and sites are systematically dealt with, the clinical and encephalographic findings sometimes being correlated with relevant case history records. The text is freely illustrated, with excellent prints of X-ray films and helpful diagrams. Special sections are devoted to air studies in children and in post-traumatic cases.

This book will be widely accepted as a very valuable work on air encephalography, which continues to be a most important method of intracranial investigation despite the development of other diagnostic procedures. It is highly recommended to all practising neurology and neurosurgery.

**Therapeutic Use of Artificial Radioisotopes.** Edited by Paul F. Hahn, Ph.D.; 1956. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Limited. 9" × 6", pp. 424, with illustrations. Price: $10.00.

THIS new publication is to be commended as a valuable summary of the uses up to date of artificial radioisotopes in treatment. The editor, Paul F. Hahn, has done a great deal in the development of this work in the United States of America. Certain radioisotopes have been available for over twenty years from the cyclotron, and it is over ten years since large supplies have been available from the nuclear reactors.

In general, radioisotopes have been somewhat disappointing in the therapeutic field, although newer techniques are being gradually developed. We have the impression that certain of the newer techniques in the application of radioisotopes, although ingenious and praiseworthy, have no real advantages over some of the older methods using radium or radon. This may, of course, be proved wrong with further refinements in technique.

There are 29 contributors to the present volume, most of them from America, but others from Great Britain, Sweden and Switzerland. Sections on the introductory physics of the subject, dosimetry, and availability, procurement, production and handling of the 175 isotopes are included.

The greater part of the book is devoted naturally to the treatment of malignant disease, but the treatment of thyrotoxicosis by radioiodine is dealt with in a special section at some length, and certain other non-malignant conditions, such as certain benign lesions of the eye are, it is shown, very conveniently treated by special applicators using isotopes emitting beta rays.

Two interesting sections cover the palliative treatment of malignant intraperitoneal and pleural effusions with radioactive colloids. The colloid chiefly used in these techniques has been radioactive colloidal gold ($Au^{198}$), but colloidal chromic phosphate (in the production of which there have been certain difficulties) has been used recently and would seem to have certain advantages over the gold colloid.

There is much of interest in the sections dealing with the use of radioisotopes in the treatment of patients with bladder tumours, and with the interstitial implantation of radioisotopes.

The book concludes with a chapter on teletherapy with radioactive cobalt, which can be regarded as a type of supervoltage therapy. The advantages of this form of treatment and the tumours likely to be favourably influenced by it are discussed. The book is probably the best available for those interested in this new but growing subject, and is accordingly recommended.

**Practical Forensic Medicine.** By Francis E. Camps, M.D., and W. B. Purchase, C.B.E., M.C., M.B., D.P.H., with a foreword by H. Edmund Davies, LL.B., B.C.L.; 1956. London: Hutchinson's Medical Publications, Limited. 9¼" × 6¼", pp. 541, with many illustrations. Price: 75s.

THIS is a new book. F. E. Camps is Reader in Forensic Medicine at the London Hospital Medical College, and W. B. Purchase is a Coroner for the Royal Household and the County of London.

The aim of the authors has been to give medical practitioners, medical students, lawyers and police officers a fair idea of what the subject of forensic medicine comprises. They believe that in the field of this speciality "too much has remained static in too many books for too long a time".

The subject matter is dealt with in three parts; the larger part, on forensic medicine, is followed by a shorter section on toxicology, and a short series of appendices constitutes the third part. The whole subject is dealt with concisely and from a practical standpoint. It is up to date.

The section on drowning evaluates the modern work on the problem. There is a timely statement about "vagal inhibition" as a cause of sudden death; it is too easy to invoke this as the explanation in an obscure case calling for painstaking investigation. The old formula for calculating time of death, $\frac{98{\cdot}4-T}{1{\cdot}5}$, is included by the authors and described as a rough guide to the time that has elapsed since death; it is too rough to be worthy of inclusion—we have never found it of real practical value.

The common poisons have been dealt with by the authors in the section on toxicology, with useful material on the barbiturates. The contents are set out in the form of a contents-index; the various subjects follow in alphabetical order in the text. There is no index to the book, which detracts from its value, and the illustrations are not listed.

**Essentials of Fluid Balance.** By D. A. Black, M.D., F.R.C.P.; 1957. Oxford: Blackwell Scientific Publications. 8¼" × 5½", pp. 142, with six illustrations. Price: 18s. 6d.

THE author of this book is a major contributor to the literature of the subject on which he writes. As he states himself, he has recently reviewed a dozen or so books of the same title. However, there is little doubt that this one is quite different. It is of the group of short monographs, and it courts the undergraduate and the general reader. Yet it is by no means a book for beginners. It is thoughtful, closely reasoned and "academic", requiring concentration and frequently a brushing up of physiology, to follow the arguments. It tends to promote trains of thought at a tangent, and the book itself is often neglected for long periods while these are developed. Brief it is, but not quickly read.

The arrangement is simplicity itself. "Water", "Sodium", "Potassium", "Anions and Acid-Base Balance" and "An Approach to Treatment" are its chapter headings. Each is treated with single-mindedness and in terms of basic principles. It is in no sense a practical manual, but it does provide a satisfying physiological basis for management.

In the chapter on "Water", the differentiation of water intoxication from sodium depletion is a valuable contribution, and in this respect the interesting and aggressive use of hypertonic (5%) saline infusion is discussed. The study of potassium is perhaps the highlight of the book. Whereas the renal control of sodium is easily followed because the major mass of the electrolyte is closely available to the kidney, the absorption and excretion of potassium, being at a remove from the major mass in the cells, are an extremely complex study, and the intermediary, E.C.F. potassium, bears little consistent relationship to either the cellular content or the dynamic balance.

Although the author indicates his awareness of the confusion of nomenclature in discussion of acid-base relationships, it is doubtful whether his approach in terms of

"anion" and "cation" balance really helps resolve the difficulties. After all, disturbances of hydrogen ion concentration can result only from movements of hydrogen (or hydroxyl) ion, and it would be much more helpful to indicate how changes in concentration of anion or cation reflect (they cannot determine) behaviour of [H] and [OH].

**The Biologic Basis of Cancer Management.** By Freddy Homberger, M.D., with forewords by Lauren V. Ackerman, M.D., Clarence Cook Little, Sc.D., and Alton Ochsner, M.D.; 1957. New York: Paul B. Hoeber. 9¼" × 6", pp. 376, with 10 illustrations. Price: $10.00.

THIS book is the best work yet produced on this subject. It is claimed to be of equal value to the student, the clinician and the fundamental investigator—as a text-book in oncology, an introductory work for the investigator and a vade-mecum for the advanced specialist to relate his work to that in other fields. It accomplishes all these tasks with distinction and clarity, and produces a vast compendium of facts regarding cancer within the compass of a well-produced, readable book of 350 pages.

A review of the present position of occupational and environmental cancer in man and of experimental carcinogenesis in animals introduces the book. The roles of heredity, viruses and hormones are then discussed. The important relation of the host (animal and human) and the natural history and biochemistry of cancer conclude this section. There is a satisfactory section on cancer diagnosis and a succinct account of prevention and treatment. On page 22 a very sensible survey of the controversial subject of lung cancer is to be found.

The book makes no reference to the constancy of the cancer process in humans; of its relations to the Makeham Gompertz equation; of the significance of multiple and multifocal cancer and of laterality as indices of its embryonic beginnings; of the specific human characters of many cancers; of the high metastatic potential, which causes small cancer masses to kill large patients; of the apparently constant annual death rate in lethal cancers; or of the fairly constant sub-population in each community which develops the disease and its similarity to every other cancerous population.

"The causes of most human and many animal cancers are still a deep mystery", states the author; with this sentiment we must cordially agree.

**The Physiology of Gastric Digestion.** By A. H. James, D.M. (Oxon.), M.D. (Toronto), B.Ch., M.R.C.P.; 1957. London: Edward Arnold (Publishers), Limited. 8½" × 5½", pp. 204, with 54 illustrations. Price: 28s.

A VERY great deal has been written about the working of the human stomach and gastric digestion, and this is widely scattered. A useful summary of available knowledge has been written by A. H. James, entitled "The Physiology of Gastric Digestion". Every aspect of stomach function has been treated in the widest possible manner and in a clear and critical way. The book starts with a section on the nature of the human stomach and gastric digestion, and this is followed by discussion on the passage of food into the stomach, the passage through the stomach, the extent of gastric digestion and the germicidal effect of the stomach. Then follow 75 pages on the acidity of the gastric contents and every aspect of this. The author obviously has little opinion of the value of fractional test meal examinations. The control of gastric secretion is thoroughly treated, as also are gastric mucosa, functions of gastric musculature and gastric sensation. It would be difficult to imagine a more complete treatment of the whole subject in a relatively short space; there are only 184 pages in the book. This small work can be highly recommended to anyone wishing to know the views currently held on any aspect of gastric digestion.

**Coronary Heart Disease: Angina Pectoris: Myocardial Infarction.** By Milton Plotz, M.D., F.A.C.P.; 1957. New York: Paul B. Hoeber, Incorporated. 10" × 7", pp. 368, with 107 illustrations. Price: $12.00.

As a reference work in relation to coronary disease this book is excellent. It is well arranged, excellently illustrated and fully up to date. The author intrudes his own views occasionally, and they are sound and obviously based on a long experience and enthusiasm.

The chapters are not long and cover every aspect of the subject from basic principles to medico-legal aspects. Lipid metabolism, the vexed question of diet, the fruitless attempts at surgical aid and the roles of geographic and ethnic factors are brought into brief discussion. A complete description of laboratory and instrumental aids to diagnosis and prognosis includes, as usual, a potted course in electrocardiography. Ballistocardiography is well presented, but somewhat uncritically. A series of well-chosen case reports is located in the middle of the book prior to the discussion of diagnosis, which is an unusual arrangement.

While a realization of the major importance and perhaps increasing frequency of coronary heart disease has led to intensive review of questions of ætiology and treatment, there is much basic knowledge which does not weather with time. This book covers this adequately, and one would not anticipate many changes in the text within the next few years. The author has consulted the best American authorities on each aspect of his subject, and there is little left for criticism. A closer consideration of the role of bodily activity and of heredity in ætiology would improve this aspect of the subject, and a more frank exposé of the practical difficulties and dangers of anticoagulant therapy in ambulant patients would be appropriate. The clinical aspects of differential diagnosis, as usual, do not receive the same emphasis as in British books, but the list of possible diseases which may be confused with coronary disease is greater.

This is not a book for the student, but represents a worthwhile investment for every cardiologist.

**Taylor's Principles and Practice of Medical Jurisprudence.** Edited by Sir Sydney Smith, C.B.E., LL.D., M.D. (Edin.), Hon. M.D. (Louvain), D.P.H., F.R.S. (Edin.), assisted by Keith Simpson, M.D. (Path.). "The Legal Aspect" revised by Gerald Howard, Q.C., M.P., "Psychiatry and the Law" contributed by David Stafford-Clark, M.D., M.R.C.P., D.P.M., "The Chemical Aspect" revised by L. C. Nickolls, M.Sc., A.R.C.S., F.R.I.C. Volume II; Eleventh Edition; 1957. London: J. and A. Churchill, Limited. 9¼" × 6", pp. 652, with 47 illustrations. Price: 80s.

VOLUME II of the eleventh edition of this book has been issued under the editorship of Sir Sydney Smith. The editor rightly points out that medical jurisprudence has grown so much and is so specialized that it is beyond the capacity of any one person to be master of it all. Accordingly he has had the assistance of Keith Simpson, Gerald Howard, David Stafford-Clark and L. C. Nickolls in the preparation of some parts of the work. They have attempted a more radical revision of the previous edition so as to keep "Taylor" up to date. Volume II contains two sections; the first deals with sexual medical jurisprudence, and the second and larger portion of the volume is devoted to toxicology.

The subject matter is well set out, the discussion is good, there are 47 illustrations and some very valuable references have been included. There is a most useful and practical exposition of the subject of legal live-birth, and some very helpful generalizations are made on page 171. Part of the evidence in the "Chapman" case is detailed in the section on antimony poisoning, and this has its value for the type of question likely to be asked in court. Many of the more recent drugs introduced into medicine have been included in the toxicology section in this edition, and this part of the work will be welcomed. This is one of the best works of reference on medical jurisprudence available.

**Studies on Fertility: Including Papers Read at the Conference of the Society for the Study of Fertility, London, 1956: Being Volume 8 of the Proceedings of the Society.** Edited by R. G. Harrison, M.A., D.M.; 1957. Oxford: Blackwell Scientific Publications. 8½" × 5½", pp. 148, with many illustrations. Price: 25s. (English).

THIS book contains the recent trends in research work in Great Britain on the subject of fertility in human beings and in animals. The papers were read at the annual conference of the British Society for the Study of Fertility in the year 1956. The papers are both clinical and scientific and are published annually, this volume containing the proceedings of the eighth congress.

In the section devoted to the male there are papers of interest to the clinician, such as the use of partitioned ejaculates, testicular biopsy, the initiation of motility in spermatozoa and thermo-regulation of the testes. There are also papers on more basic research, such as the effects of occlusion of the superior epididymal arteries in the rat, and the effect of sulfhydryl concentration on motility of sperms.

In the section dealing with the female there is an up-to-date review of the use of the new long-acting progestational compound named 17-anhydroxy progesterone capronate in sterility and in habitual abortion. This chemical is now available in the commercial market and clinicians should understand the indications for it, as it has been greatly

acclaimed in the medical Press. Research workers should note that the administration of this compound does not greatly increase the excretion of pregnanediol in any degree, as it is mainly excreted as pregnanetriol. It is the best compound yet available for defective nidation in either sterility or habitual abortion, though a recent preparation for oral use appears likely to challenge its position.

There is also a valuable review of the therapeutic measures used at an infertility clinic during the last 20 years. It includes the results obtained in 37 women given small-dose X-ray treatment for anovulation. At the present time this therapy is controversial, but it produces results, as shown in the paper. A further paper describes the effect of larger doses of X rays on mammalian spermatozoa and eggs.

It may be said that this book contains basic information essential to any doctor interested in the problems of infertility. It is both academic and clinical, and it indicates that we in Australia are doing too little original work in this field. The veterinarians are much more active than the doctors.

The printer is to be congratulated especially on the reproduction of photomicrographs, and on the clarity of the letterpress, which occupies 131 pages. This book must be read by all those who think over the problems of infertility, and will serve as a stimulus to those who say that nothing can be done for a subfertile male.

**Progress in Neurobiology: 2. Ultrastructure and Cellular Chemistry of Neural Tissue.** Edited by Heinrich Waelsch, M.D., with 37 participants; series editors, Saul R. Korey, M.D., and John L. Nurnberger, M.D.; 1957. New York: Paul B. Hoeber. 9¼" × 6", pp. 272, with 40 illustrations. Price: $7.50.

THE publication of papers and discussion given at symposia on selected topics in biology and medicine is becoming very frequent. In 1956, Part I of "Progress in Neurobiology: Neurochemistry" appeared. Part II, "Utrastructure and Cellular Chemistry of Neural Tissue", has recently been published. Thirty-seven authorities on various aspects of neurobiology, mostly from the United States, took part in the disoussion. Fifteen papers, on a wide variety of subjects, were given. Some of these were concerned with the finer structure of nervous tissue, such as the ultrastructure of double membranes, the fine structure of the neurohypophysis, the cell density of neural tissues. Others were concerned with the microchemistry of nervous tissues in health and disease, such as metachromatic lipids in diffuse sclerosis, the distribution of certain enzymes in different parts of the brain and the effect of various drugs, such as barbiturates and chlorpromazine, on cell enzymes in the brain. A paper of great interest in this section was "Quantitative Analysis of Simple Nerve Cell Bodies" by O. H. Lowry. This describes in some detail methods used for the estimation of 12 enzymes and three other tissue constituents applicable to samples of the order of magnitude of single-cell bodies. For the estimation of some of these, as little as one millimicrogramme ($10^{-9}$ gramme) was sufficient. The authors of all the papers were very highly qualified and the discussions were of a high standard. The subject matter of the papers was very specialized, and there can be few biologists and still fewer medical men for whom the papers would be of much use. For anyone having the necessary training in neurobiology, this collection of papers and the discussions will be invaluable.

## Books Received.

*[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]*

"The Early Diagnosis of the Acute Abdomen", by Sir Zachary Cope, B.A., M.D., M.S. (Lond.), F.R.C.S. (Eng.); Eleventh Edition; 1957. London, New York and Toronto: Oxford University Press. 8¼" × 5¼", pp. 204, with 36 illustrations. Price: 29s. 9d.

A complete revision of a standard book first published in 1921.

"Fat Consumption and Coronary Disease: An Evolutionary Answer to this Problem", by T. L. Cleave, M.R.C.P. (Lond.), with a foreword by Percy Stocks, C.M.G., M.A., M.D. (Camb.), F.R.C.P. (Lond.), F.S.S.; 1957 Bristol: John Wright and Sons, Limited. 7¼" × 4¼", pp. 40. Price: 5s.

Described by the author as "a basic approach to the prevention and arrest of coronary disease".

"The Year Book of Pediatrics (1957-1958 Year Book Series)", edited by Sydney S. Gellis, M.D.; 1957. Chicago: The Year Book Publishers, Incorporated. 7¾" × 5¼", pp. 472, with 153 illustrations. Price: $7.50.

One of the Practical Medicine Series of Year Books.

"An Introduction to Chest Surgery", by Geoffrey Flavell, F.R.C.S. (England), M.R.C.P. (London); 1957. London, New York and Toronto: Oxford University Press. 8¼" × 5¼", pp. 370, with 49 illustrations. Price: 49s. 9d.

The author has set out to write a book suitable for students in price and in readability.

"The Epidemiology and Control of Malaria", by George Macdonald, C.M.G., M.D., F.R.C.P.; 1957. London, New York and Toronto: Oxford University Press. 8¼" × 5¼", pp. 272, with 17 illustrations. Price: 54s. 6d.

The author is Director of the Ross Institute of Tropical Hygiene and Professor of Tropical Hygiene in the London School of Hygiene and Tropical Medicine.

"Psychomatic Ophthalmology", by T. F. Schlaegel, jnr., M.D., with the collaboration of Millard Hoyt, M.D.; 1957. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 6", pp. 536. Price: £6 1s.

Written by an ophthalmologist with the collaboration of a psychiatrist.

"Shock and Circulatory Homeostasis: Transactions of the Fifth Conference, November 30, December 1 and 2, 1955, Princeton, N.J.", edited by Harold D. Green, M.D., D.Sc.; 1957. New York: The Josiah Macy, Jr. Foundation. 9" × 6", pp. 340, with 78 illustrations. Price: $4.75.

Consists of a series of papers and discussions on studies of shock, mainly experimental, and related subjects.

"Practical Electrocardiography", by Henry J. L. Marriott, M.D.; Second Edition; 1957. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 6", pp. 248, with 158 illustrations. Price: 55s.

The first edition was published in 1954 and was twice reprinted. The text has been revised for this edition.

"The Century of the Surgeon", by Jürgen Thorwald; 1957. London: Thames and Hudson. Sydney: Walter Standish and Sons. 8¾" × 5¼", pp. 428, with 66 illustrations. Price: 25s. (English).

The story of the advances of surgery in the nineteenth century.

"Biochemistry of Some Peptide and Steroid Antibiotics", by E. P. Abraham. New York: John Wiley and Sons, Inc. London: Cahman and Hall, Limited. 4¼" × 7¼", pp. 112, with many illustrations. Price: $3.00.

The 1957 Ciba Lectures in Microbial Chemistry.

"The Public Health Laboratory Service, First Report of the Expert Committee on Health Laboratory Methods"; World Health Organization Technical Report Series, No. 128. Geneva: World Health Organization. 9¼" × 6¼", pp. 51. Price: 3s. 6d.

The role and organization of a public health laboratory service are considered, with special attention to the problems confronting under-developed countries.

"Juvenile Epilepsy: Report of a Study Group"; World Health Organization Technical Report Series, No. 130; 1957. Geneva: World Health Organization. 9¼" × 6¼", pp. 44. Price: 1s. 9d.

The study group included specialists of a variety of disciplines from both European and American countries.

"Joint FAO/WHO Expert Committee on Milk Hygiene: First Report", published jointly by FAO and WHO and issued also as "FAO Agricultural Studies, No. 40"; 1957. Geneva: World Health Organization. 9¼" × 6¼", pp. 55. Price: 3s. 6d.

Deals with practical aspects of the provision of a hygienic milk supply.

"Treatment and Care of Drug Addicts", Report of a Study Group, World Health Organization Technical Report Series, No. 131. Geneva: World Health Organization; 1957. 6¾" × 9¼", pp. 19.

The report of an international study group which met in November, 1956.

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## TOXOPLASMOSIS.

ALTHOUGH toxoplasmosis has been known in man and animals for a long time, it is only during the last few years that much attention has been paid to it. Modern text-books on medicine either do not treat it at all or give it scant space. It is a curious disease in many ways. All mammals and some birds can be infected by the parasite. Very many infections in man and animals are symptomless and can be recognized by the presence of immune substances in the blood or, occasionally, by the isolation of the parasite from the blood or organs. When symptoms occur, they are extraordinarily varied in nature and distribution. The disease has been recognized in most countries, but according to W. H. Wright[1] evidence would seem to indicate that infection is more prevalent in warm moist areas than in cold or hot dry areas. Cases occurring in Australia have been described by E. G. Robertson,[2] A. R. Edmonds,[3] I. B. Jack,[4] R. Hertzberg,[5] N. Kerkenezov,[6] E. S. Finckh,[7] M. J. J. O'Reilly,[8] C. Swan and E. French[9] and A. Garven.[10]

Toxoplasmosis is caused by a protozoan, *Toxoplasma gondii*, a crescent-shaped organism, which is an obligate, intracellular parasite rapidly destroyed outside the body. How the organism is transmitted from man to man or from animal to man is not yet known. Clinical toxoplasmosis has been found in chickens, pigeons, dogs, cats, swine, sheep and cattle. O. Makstenieks and J. D. Verlinde,[11] in a very detailed account of toxoplasmosis in the Netherlands, consider that there seems to be an epidemiological relationship between toxoplasmosis in man, dogs and cats. A high percentage of cattle and pigs possess toxoplasma antibody, yet there is no evidence of infection in man during slaughtering. Animals such as mice are easily infected by injection, provided that the injection material is very fresh, for the organism is very labile outside the body. In the congenital form of toxoplasmosis, which is the most commonly recognized form of the acute disease, the organism is transmitted to the fœtus *in utero* or during birth from a mother who is suffering from an asymptomatic infection. It is unknown for a mother to have more than one child infected in this way. There is no satisfactory evidence that ectoparasites play any part in infection.

The clinical manifestations of acute toxoplasmosis are very varied. The most fatal type, and the one most commonly recognized clinically, is congenital toxoplasmosis. Here there is a characteristic tetrad of symptoms: chorioretinitis, sometimes with nystagmus, microcephaly or hydrocephaly, convulsions and cerebral calcification. In the more acute cases there are also fever, icterus, generalized maculo-papular rash, splenomegaly, hepatomegaly, pneumonitis and myocarditis. W. H. Wright,[1] accepting a classification originally given by J. C. Siim, described the forms of the disease in older children and adults. In the exanthematous type the infection is characterized by a typhus-like syndrome, with an acute onset. Typically, a red, non-hæmorrhagic, maculo-papular rash involves the whole body with the exception of the scalp, palms and soles. The rash disappears in one or two weeks. There may be evidence of myocarditis and meningo-encephalitis. Termination is usually fatal. In the cerebro-spinal type there are fever, delirium, generalized convulsions, lymphadenopathy and mononuclear pleocytosis. This form is rare and usually fatal. In the ophthalmic type there are manifestations of chorioretinitis, irido-cyclitis and other eye disturbances. This form is being recognized with increasing frequency, although the diagnosis is difficult. Wright states that at least 35% of cases of granulomatous uveitis among 298 patients seemed to be caused by toxoplasma. The lymphadenopathic type is relatively common. Here there may or may not be fever together with lymphadenopathy, malaise and fatigue.

The symptoms of post-natal toxoplasmosis are then so variable that clinical diagnosis is difficult if not impossible. The only certain criterion is the isolation of the parasite from the blood, spinal fluid or organs, and this is not easy. Some dependence may be placed on certain serological tests, and, because of the relatively late appearance of a positive response to the complement-fixation test after infection, more reliance should be placed on the Sabin-Feldman dye test, provided the titre is not lower than 1:128, according to Makstenieks and Verlinde. Both these tests require peritoneal fluid from mice infected with toxoplasma. The complement-fixation test is carried out in the ordinary way. The dye test depends on the fact that there is in the blood serum of infected persons, or persons who have been infected, an unidentified substance which modifies the cytoplasm of living toxoplasma, so that it will not stain with methylene blue. The titre is the dilution of serum which will give 50% of dyed organisms. It is obvious that all these tests require special conditions in the way of central laboratories etc. Diagnosis then is very difficult and in general practice almost impossible. A matter of considerable interest is the obtaining of positive findings from serological tests in a large proportion of the population in all countries where

[1] *Am. J. Clin. Path.*, 1957, 28:1 (July).
[2] M. J. AUSTRALIA, 1946, 2:449 (September 28).
[3] M. J. AUSTRALIA, 1949, 1:456 (April 2).
[4] M. J. AUSTRALIA, 1952, 1:391 (March 22).
[5] M. J. AUSTRALIA, 1952, 2:45 (July 12).
[6] M. J. AUSTRALIA, 1953, 2:262 (August 15).
[7] M. J. AUSTRALIA, 1954, 2:965 (December 18).
[8] M. J. AUSTRALIA, 1954, 2:968 (December 18).
[9] M. J. AUSTRALIA, 1956, 1:1009 (June 16).
[10] *Australasian Ann. Med.*, 1957, 6:141 (May).
[11] *Docum. med. geog. et trop.*, 1957, 9:213 (September).

[1] *Am. J. Clin. Path.*, 1957, 28:1 (July).

they have been looked for. The complement fixation persists for only one or two years after infection, but the dye response is given several years after infection. A titre of 1:16 is taken as positive evidence that a person has been infected with toxoplasma. The percentage of positive results in a population varies from about 6% in children in Memphis, Tennessee, to 94% in adults in Guatemala. There is an increase in the percentage with increasing age. For example, A. Garven[1] found in testing sera obtained from unselected people in Sydney and Melbourne that the percentage of positive results varied from 8% in children aged up to nine years to 25% at ages from 20 to 29 years, and 34% at ages of fifty and over.

There are two groups of drugs which have some activity against toxoplasma. These are the sulphonamides, particularly sulphadimidine, sulphamerazine, sulphadiazine and sulphapyrazine, and pyrimethamine ("Daraprim"). Best results, according to Wright, are obtained by using a sulphonamide with pyrimethamine. The patients have to be watched very carefully because of the dangerous side effects of pyrimethamine. The important requirement, however, is that the condition should be diagnosed. The figures given in Garven's excellent paper indicate that the condition is more common in Australia than many clinicians probably realize.

# Current Comment.

## SOCIAL AND PREVENTIVE MEDICINE.

MATTERS of wide interest are included in a report which has been received of a World Health Organization Study Group on Social and Preventive Medicine which met in the Philippines in October, 1957. During the two-week meeting, participants consisting of deans of medical schools and professors of social and preventive medicine from Australia, Cambodia, China (Taiwan), Fiji, Hong Kong, Japan, Korea, New Zealand, the Philippines, Singapore and Vietnam discussed problems connected with undergraduate teaching in social and preventive medicine.

The meeting approved a report stating that the objective of teaching in social and preventive medicine should be to make students actively aware of social needs with respect to the medical services which they could offer and to acquaint them with the role of social organization in the genesis, course, distribution, prevention and treatment of disease. It was considered that teaching methods would have to vary in different countries, but that a practical approach was always desirable. In discussing curriculum details the group was of the opinion that some traditional public health teaching should be retained, and it outlined programmes extending throughout the whole medical course. In considering the organization of teaching departments of social and preventive medicine the group felt that a statement of function of such departments should first be made. This had three phases: teaching, research and community service. It was also agreed that the department should play some part in the training of paramedical workers. The community service would vary with the stage of social service development of the community in which the medical school was located.

The group agreed that a separate, independent department within the medical school was needed. This should have a full-time head of department and at least one other full-time staff member as well as several part-time members. To achieve this level of staffing it was necessary to offer salaries commensurate with the importance of the position and on equal terms with clinical teachers in the medical school. On the question of relationship with other departments of the medical school, discussion revealed that in the countries represented at the meeting such relationship varied from the most cordial to the opposite extreme. Much depended on past history. Various means of obtaining good relations were considered. The group felt that formal integration programmes should be approached with caution and should involve much more planning than was usually made. In any case, much of importance in individual courses might be sacrificed in achieving overall integration.

Responsibility for teaching comprehensive health care was discussed, and participants heard accounts of practical experiments in such teaching. It was considered that a case might sometimes be made for medical schools creating comprehensive health clinics, but a better method was for the medical school to use existing services whether those were provided by government or other agencies.

Consideration next turned to the question of utilization of community resources in medical teaching with special reference to social and preventive medicine. It was agreed that such use was essential. Rural and urban health centres were valuable, and all social resources must be employed in teaching social and preventive medicine. Cooperation between the medical school and the community must not be impeded by political disharmonies. Teaching hospitals were, of course, a community resource in themselves, and a modern tendency was for hospitals to develop health and preventive work. Students should take part in such work as in other aspects of hospital service.

Research in social and preventive medicine also engaged the attention of the participants. It was agreed that a balance should be struck between applied and fundamental research. It was often difficult to forecast the probable value of a given research programme, and most research proved valuable in adding to useful knowledge. Much research would be epidemiological in the modern sense of the term and would be concerned with isolating ætiological factors that might prove amenable to control.

## ROLE OF THE PUBLIC HEALTH INSPECTOR.

THE most impressive trend in the specialty of public health today is the increasing attention being given by its practitioners to the individual—to the human subject rather than to his environment. In the field of immunization against infections, for instance, the developments have been particularly striking. Problems of child delinquency, of alcoholism and of the care of the aged are examples of other lines of activity.

Yet, with all the modern advances, there remains the influence of housing, sanitation, food control and other long-established public health features as a potent factor in human welfare. Community health still depends a great deal on these environmental factors, and their supervision is the special care of the public health inspector. The quality of his work may influence profoundly, for good or ill, the well-being of the people. It is necessary that public health inspectors should be intelligent and high-principled men, well informed on the multiplicity of the matters likely to arise in their work. They are generally required to hold the certificate of the Royal Society of Health.

The English text-book on which health practice is largely based in British countries is Clay's handbook.[1] For 25 years this has proved a popular and sound guide. The only difficulty in accepting "Clay" wholeheartedly is that the health laws vary in different countries. Much space in the book is given to considering the range and application of English health laws. Some items may be limited in application: not every country, for instance, is concerned with health rules for canal boats. Yet, whatever the laws,

[1] *Australasian Ann. Med.*, 1957, 6:141 (May).

[1] "The Public Health Inspector's Handbook: A Manual for Public Health Officers", by Henry H. Clay, F.R.S.H., F.I.P.H.E., assisted by Ronald Williams, O.B.E., D.P.A., F.R.S.H.; Ninth Edition; 1957. London: H. K. Lewis and Company, Limited. 8½" × 5½", pp. 636, with 101 illustrations. Price: £2 (English).

the basic principles are fairly fixed and are general in their application. Besides, the modern idea is to teach people the desirable ways for healthy living rather than to harass them with laws. The law comes in when persuasion fails, or when the offence is gross and flagrant. Moreover, the health inspector must know the use and range of the laws he works with.

This book covers the whole gamut of public health; it is well balanced and clear in its directions. The opening chapter provides a short outline of the evolution of public health laws. The chapters on housing, smoke abatement, food standards and food handling have been revised, and will be especially useful in the training of inspectors in built-up and industrial areas. The methods for dealing with insect pests and minor vermin are set out clearly. Reference to undertakers is interesting; under hydrogen cyanide regulations an "undertaker" means "any person who under contract or otherwise undertakes . . . fumigation"; proper care in conducting fumigation will enable that particular undertaker to avoid the need for the other type.

"Smog" has been a serious problem in Britain, and to deal with it the *Clean Air Act* was proclaimed in 1956. The Act provides not only for the abatement but for the prevention of atmospheric pollution by smoke; now for the first time the emission of smoke from all chimneys may be dealt with, even those of private houses.

To extract the maximum value from this book the student must adapt its dicta to local conditions and local law. For men engaged in health work that is not an insuperable task; indeed, the additional knowledge of English requirements assists in the work in other places, and encourages a wide outlook. Nor is the information of use to inspectors alone. The many medical men who give part-time service as advisers to local health authorities will benefit from referring to "Clay" the various matters that come for their consideration. Especially in country centres in Australia, the combined efforts of doctors and health inspectors are of great community value. "Clay" will help to keep the standard of the work at the highest level.

## ALUMINIUM POWDER FOR BURNS.

VERY many methods have been employed for the treatment of thermal burns. At the present time the exposure treatment without occlusive dressings seems to be favoured. The serum clot, as it develops unaided, tends to be very fragile and to crack readily, and once this has occurred infection can easily become established. Search has been made for an innocuous substance, capable of producing the astringent coating effects of tannic acid with all the attendant advantages, but without its disadvantages. Marvin D. Maxmen[1] has tried aluminium powder and finds it a very satisfactory addition to exposure treatment. Aluminium foil has been used, but is not so satisfactory. Aluminium powder with a mean particle size of 50$\mu$ forms a very satisfactory cover on the burn surface. Coarser or finer powders are not so effective. The powder is sterilized by baking for two hours at 320° F. The burn surface is cleared with a suitable detergent, blisters are broken, and loose skin is removed. The aluminium powder is then dusted on, and a bright, moist, metallic aluminium cover forms at once. The nurse applies more powder as necessary to keep the surface dry. In 48 to 60 hours a tough, pliable, painless aluminium coating covers the area. The eschar gradually separates from the edges with complete healing in eight to twelve days. In the management of circumferential burns, surgical towels heavily dusted with aluminium powder are placed beneath the patient to prevent direct contact with bed linen. Over 600 patients with severe burns have been treated by Maxmen and a large number with minor burns as out-patients with very satisfactory results. The use of aluminium powder simplifies the exposure treatment of severe burns, especially when trained staff is scarce.

[1] *Arch. Indust. Health*, 1957, 16: 414 (November).

## A RARE HEREDITARY OLIGOPHRENIA.

THE greater part of the Swedish population is concentrated along the lowlands of the southern and eastern coasts. The rest is dispersed over a much greater area in a number of communities, suffering various degrees of isolation due chiefly to the high mountain ranges and the climate. Especially in the past, many of these small Swedish communities have been cut off from the outside world for a great part of the year, and there has been a great tendency for the same families to occupy the same land for hundreds of years. Inbreeding is naturally common, since in a small community a person has relatively few from whom to choose a spouse. Now consanguinity of parents is a condition that enables rare recessive genes to manifest themselves. Sweden, moreover, has been fortunate in having had for some hundreds of years an excellent system of parish records of births, deaths and marriages, which have been preserved to the present in the absence of invasion by foreign armies or serious civil strife. Members of the brilliant Swedish school of geneticists, of whom the late Gunnar Dahlberg and Torsten Sjögren are probably the best known abroad, have taken full advantage of these conditions to study diseases produced by recessive genes. Dahlberg introduced the notion of "isolate" into human genetics to cover such communities, isolated by geographical factors, or others, such as the Parsees, isolated by religious or other factors.

Sjögren and Tage Larsson[1] have recently published a fine example of such work on recessive characters. In the summer of 1955, five patients were found in institutions in the county of Västerbotten, in the north of Sweden, who were suffering from low-grade oligophrenia, ichthyosis and spastic pyramidal symptoms. The authors then decided to look throughout the asylums of Sweden for other such cases associated with ichthyosis. In all, 28 cases of what appears to be a new syndrome have been found. The syndrome is characterized by congenital stationary low-grade oligophrenia, congenital stationary ichthyosis, which may be diagnosed as ichthyosiform erythrodermia, and congenital symmetrical spastic pyramidal symptoms in the extremities, particularly the legs. The spastic disorders are those typical of Little's disease. Practically all subjects had an intelligence quotient less than 50 and many even of less than 30. The morbid picture is distinctive, and the diagnosis can be made clinically. Mortality is high throughout life. The syndrome is not due to a coincidence of the action of a number of different diseases, as no reduced syndrome was detected among the parents and the siblings of the affected persons. The incidence of other neuropsychiatric disorders was not unduly high in the relatives. Exogenous causes did not appear to be important. It is established that the disease has a genetic cause, and the mode of inheritance is by a single autosomal recessive gene. In all except three cases, the parents were born in the county of Västerbotten, and descent could be traced back to a restricted area of the county. The results of the geographical and genealogical analysis suggest that the disease had its origin in a single gene mutation, five or six generations ago. These conclusions seem to be well justified by the argument of the text, and one can only commend the persistence of the workers, who, for example, traced almost every ancestor back to the fifth generation and examined thousands of relatives, and admire the skill with which the analysis has been carried through.

[1] "Oligophrenia in Combination with Congenital Ichthyosis and Spastic Disorders: A Clinical and Genetic Study", by Torsten Sjögren and Tage Larsson, with the assistance of Göta Petersson; 1957. Copenhagen: Ejnar Munksgaard; *Acta Psychiatrica et Neurologica Scandinavica* Supplement 113, Volume 32. 9¾" × 6¼", pp. 113, with eight illustrations. Price: 65 Danish Kroner per volume.

# Abstracts from Medical Literature.

## DERMATOLOGY.

### Acrodermatitis Enteropathica.

E. L. PIPER (*Arch. Dermat.*, August, 1957) reports a case of *acrodermatitis enteropathica* in an adult woman, aged 46 years, who had had a mild intermittent form of the disease most of her life. This disease was first recognized in 1942 as a rare clinical entity distinct from *epidermolysis bullosa dystrophica*. The salient differentiating features of *acrodermatitis enteropathica* are: (i) gastro-intestinal disturbances with mucoid stools; (ii) partial alopecia; (iii) periorificial dermatitis; (iv) bullous lesions not preceded by trauma; (v) frequent cutaneous moniliasis and the presence of *Candida albicans* in the stools; (vi) response of the disorder to diiodohydroxyquin; (vii) a distinctive histological picture. The present case is held to be unique. Diiodohydroxyquin was administered orally in doses of 650 milligrammes four times a day. Reduction in the lesions was noted within a week, and on this dosage the patient had remained well for nine months up to the time of the presentation of this report.

### The Treatment of Herpes Zoster.

E. EPSTEIN AND H. V. ALLINGTON (*Arch. Dermat.*, October, 1957) review the results of treatment of *herpes zoster* presented in 37 different articles published over the past 26 years. These articles announce or discuss 22 basically different methods of treatment, illustrated by the histories of 251 patients. The average number of cases reported per article is 19, which, the authors point out, is too small a figure on which to base sound conclusions, in the case of a self-limiting disease. The authors undertook this review to find out whether autohæmotherapy was an effective way to shorten the course of the disease. This treatment was given to 98 patients included in the present review. Other treatments included the exhibition of various broad-spectrum antibiotics, vitamin *B*, given orally and parenterally, injections of "Pituitrin", X-ray therapy, the administration of corticosteroids, and symptomatic treatment only. Many of the patients received more than one form of therapy. These cases were analysed according to the period during which the patient was under treatment. The figures for the duration of the disease in patients submitted to various forms of treatment were strikingly similar. By these criteria it would appear that the type of treatment employed made no difference to the duration of the disease.

### Chromate Dermatitis.

J. H. BERNHARDT (*Arch. Dermat.*, July, 1957) states that chromate dermatitis is a common source of trouble in industry. It may be found in workers in many manufacturing processes, including match making, photography, mordanting, textile printing, dye manufacturing, fur dyeing, electroplating, photo-engraving, lithographing, chrome plating and the manufacture of ink and paint pigments. Most of the "prime" paints in the aviation industry have a chromium salt base. Chromic acid or strong solutions of chromate salts may be primary irritants; however, the usual variety of chromate dermatitis is due to sensitization. The diagnosis of industrial chromate dermatitis is usually established by the presence of dermatitis affecting the exposed parts, a history of exposure to chromates and a positive response to the patch test with 0·5% potassium dichromate solution. The dermatitis may be acute, erythematous, vesicular and oozing. In other cases it may be rather torpid and of a low-grade, patchy character. Very often a nummular configuration is seen. It is slow to heal. The natural evolution of the disease apparently requires a healing time of approximately 12 weeks without exposure to chromates. Treatment must therefore be combined with absolute avoidance of contact with chromates. Local treatment with cortico-steroids combined with neomycin gives the quickest results in chromate eczema. Prednisolone (0·5%) ointment combined with neomycin seems to be somewhat superior to 1·0% hydrocortisone ointment combined with neomycin.

### Embedded Extraneous Hair.

M. J. SCOTT (*Arch. Dermat.*, July, 1957) states that extraneous hair which has become separated from its host, may penetrate skin and act as a foreign body. This foreign-body reaction is clearly acquired in nature, and is not congenital. The author classifies clinical manifestations that result from hair penetration as follows: (i) minimal reactions; (ii) abscess formation; (iii) sinus formation; (iv) foreign-body granulomata; (v) miscellaneous reactions; (vi) mixed reactions. Since these disorders are usually benign, causing little if any discomfort, medical attention is rarely sought. Removal of the offending hair is curative in early lesions. Treatment of deep abscesses, sinuses and deep granulomata requires surgical intervention. Total excision, or incision with curettage of sinuses and granulomata, is frequently necessary.

### Pustular Eruptions of the Hands and Feet.

J. EVERALL (*Brit. J. Dermat.*, July-August, 1957) presents his findings and assesses the role of focal sepsis in the cause and cure of intractable pustular eruptions of the hands and feet, commonly called pustular psoriasis or pustular bacterid. There are several patterns. One pattern has been called by Andrews a pustular bacterid, another by Barker a pustular psoriasis, and a third by Audrey and by Dore an abortive form of *acrodermatitis persistans*. The essential feature of the pustular bacterid type is discrete pustular vesicles, the size of a pin-head, which dry to brown macules with scaling and erythema, usually presenting on the centre of the palms and soles. The pattern described as pustular psoriasis consists of scaling psoriasiform areas, in which pinhead-sized intraepidermal pustules form and later develop into yellow spongy scabs; these on removal disclose red glazed skin with innumerable flat lakes of pus. The sites of election are the eminences of the hand and inner side of the sole. The third pattern consists of small, well-circumscribed areas of pinhead-sized lakes of pus which dry to brown macules with very little surrounding inflammatory reaction, symmetrically situated on the thenar eminences and on the inner soles, usually confined to the same areas for many years. Microscopic and cultural examinations for microorganisms in the patches invariably give negative results. All these reactions represent an individual pattern of reaction to some stimulus, and are probably a combination of psoriasis with an ordinary catarrhal eczematization. This reaction may be excited by a variety of factors, such as acute or chronic infection and hormonal or emotional stress. Ingram recently has stated that about 30% of his patients with pustular psoriasis of the hands and feet had some septic focus, but that treatment of the sepsis rarely produced a permanent cure. The author does not think that the removal of focal sepsis in these patients does produce a cure. Hellier had a case in which the eruption on the hands and feet was controlled by dapsone therapy. In discussing therapy, the author concludes that chemotherapy and the administration of antibiotics have often failed to affect the course of the disease permanently. Steroid hormonal therapy has not helped. Tar seems to be the most helpful medicament, used as the crude product, or in a paste, or as *Liquor Picis Carbonis* applied as a paint or wet dressing. Sometimes ichthammol paste, applied either alone or after treatment with tar, gives relief.

### The Use of Hydrocortisone in Dermatitis Herpetiformis.

J. O'D. ALEXANDER (*Brit. J. Dermat.*, July-August, 1957) observed the effect of local application of hydrocortisone in 13 cases of *dermatitis herpetiformis*. Hydrocortisone acetate made up in a greasy base was used in a strength of 2·5% in most cases, but in some a 1·0% ointment was also tried. Control trials using the base alone in eight cases showed that local application of hydrocortisone did have some effect. This was only temporary, but all the patients who were benefited were quite emphatic that the decrease in itching occurred within a few minutes of application. In cases in which the condition is difficult to control with either sulphapyridine or dapsone, it may be brought under control more easily if hydrocortisone ointment is applied simultaneously.

### Electrodesiccation of Pigmented Nævi.

R. G. WALTON, R. D. SAGE AND E. M. FARBER (*Arch. Dermat.*, August, 1957) report on 168 pigmented lesions which were removed by "shave biopsy" and light electrodesiccation from 82 subjects. Further specimens for biopsy were taken from 112 of the lesions in 75 subjects at intervals of three to 12 months after the original procedure. No evidence of malignant degeneration was seen following the partial removal and electrodesiccation of pigmented nævi. Recurrence of pigment in treated sites was a common finding and did not indicate that malignant change was taking place. Nævi treated

in this manner were often completely removed, and if not, the remaining nævus cells were buried in scar tissue. The authors conclude that this is a safe procedure, provided initial treatment is accompanied by competent pathological evaluation of tissue removed. Clinical diagnosis was proved to be incorrect in 7·1% of the lesions treated. From the cosmetic point of view this is a highly desirable procedure and avoids unnecessary surgical excision.

### Immune Human Globulin for Trichophyton Rubrum Infection.

W. E. SHECTOR, R. F. MORGAN AND W. BLUM (*Arch. Dermat.*, August, 1957) report a cure of chronic, recalcitrant and extensive *Trichophyton rubrum* infection. Human immune globulin therapy for this condition is a new approach. The case reported presents strong evidence to suggest that clinical cure was effected by this agent. It was empirically decided to give the patient two cubic centimetres of human immune globulin three times a week. Twelve treatments were given. Within 48 hours there was relief of pruritus and visible diminution of erythema intensity in all areas of involvement.

## UROLOGY.

### Plastic Operations on the Ureter.

E. A. WEBB, B. A. SMITH AND W. E. PRICE (*J. Urol.*, June, 1957) state that after a period of trial it has become apparent that plastic operations on the ureter, without intubation, as described by Hamm and Weinberg, have the advantages of simplified technique and uniformly satisfactory results. This report deals with 18 cases; 11 of these operations were performed for relief of obstruction at the uretero-pelvic junction, one for obstruction due to a retrocaval ureter and six to implant the ureter into the bladder. It is noted that the period of hospitalization is shorter, while the early follow-up results are good. Additional apparent advantages are conservation of renal tissue by elimination of the trauma of nephropexy, fewer febrile reactions and less likelihood of calculus formation and stricture of the ureter. In practically all cases of ureteropelvic obstruction the plastic operation took the form of the modern ureteroneopelviostomy. The only provision for drainage was a small stab wound in the posterior wall of the renal pelvis with a soft drain down to this point. A simple nephropexy was usually performed. At the lower end of the ureter reimplantation (uretero-neocystostomy) was performed after trauma in four cases, and on account of neoplasm in two. Again, no splint or ureteric drain was used, simply a tissue drain down to the site of operation. A certain amount of urinary drainage occurs for a few days after operation, the average being 3·5 days at the upper end and 6·8 days at the lower end of the ureter. The average period of hospitalization was only 7·6 days after operation in the former group, and 11·6 in the latter.

### Wilms's Tumour.

B. S. ABESHOUSE (*J. Urol.*, June, 1957) gives a review of the management of Wilms's tumours based on the replies of 96 surgeons, an extensive review of the literature, and a personal experience of six cases. Wilms's tumour of the kidney is the most common urinary tract neoplasm in infancy and childhood. It most frequently occurs in the first four years of life. The total number of patients in this study was 856, of whom 777 came to nephrectomy. An analysis of methods of treatment indicated the following order of preference: nephrectomy *plus* post-operative irradiation, 44%; pre-operative irradiation, nephrectomy and post-operative irradiation, 22%; pre-operative irradiation *plus* nephrectomy, 10%; nephrectomy alone, 5·2%; irradiation alone in inoperable and in bilateral cases, 7·2%. This study brings to light several striking findings: (i) a very low operative mortality (2·7%); (ii) a very high proportion (54%) of patients dying in the first year after operation; (iii) a relatively small number of patients surviving for two or more years. A detailed study shows that better results were obtained from using irradiation both before and after nephrectomy, than by confining it to the post-operative period. The best results were obtained when the condition was diagnosed and treated in the first year of life. The transperitoneal approach is held to be preferable to the classical lumbar incision from the standpoint of operability and results. In very large tumours a thoraco-abdominal approach may be an advantage. Although Wilms's tumours and their metastases are extremely radio-sensitive, the use of irradiation is still a controversial subject. However, small, operable tumours require little or no irradiation; large tumours should receive sufficient dosage in a short period to reduce the bulk of the mass to operable size and then the kidney should be promptly removed; intensive irradiation in the post-operative period should be reserved for selected cases.

### Genital Tuberculosis in the Male.

R. J. VEENEMA AND J. K. LATTIMER (*J. Urol.*, July, 1957) report on the fertility status of 60 patients with genital tuberculosis. The pathological changes in the tissues affected are correlated with the semen analyses and fertility indices. Positive cultures or pathological specimens were required as proof of the disease. Genital tuberculosis appeared to be secondary to renal tuberculosis in 85% of patients. In most of the cases of epididymal infection this was secondary to tuberculosis of the prostate, although in 60% of these cases the *ductus deferens* was not thickened. Fertility was found to be sharply reduced by genital tuberculosis. Absent or scanty semen was a frequent sequel to prostatic tuberculosis. Total sperm counts and motility of sperms were usually reduced. The presence of bilateral epididymal nodules did not cause seminal tract blockage in all cases. The actual morphology of the semen was not affected, and the testes showed only moderately depressed spermatogenesis. The over-all effect of genital tuberculosis on the testes appeared to be one of simple tubular blockage *plus* the secondary atrophy of debilitating disease. Since any chance of normal fertility is usually greatly desired by the patient, it is now thought that all patients with prostatic and epididymal tuberculosis should be treated for two years with full chemotherapy. Epididymectomy is now advised only for patients with tuberculous abscess of the epididymis, or for those with constant urinary infection.

### Irradiation of Pituitary in Prostatic Carcinoma.

J. D. FERGUSSON (*Brit. J. Urol.*, September, 1957) states that both the gonads and the suprarenal glands are subordinate to the pituitary, and that interest has recently centred on methods of inactivating the latter to secure better endocrine control in advanced cases of prostatic carcinoma. The only practical methods of eliminating pituitary activity are by surgical ablation or by implantation of radioactive material directly into the gland. Since the current anti-androgenic therapy (castration *plus* œstrogen) gives good palliative results in many cases, there has been a reluctance to subject patients prematurely to the risks and inconveniences of a new form of treatment. Also, there is some reason to believe that only those patients who have already shown a good response to hormonal control are likely to receive additional benefit from pituitary suppression. All patients selected by the author for pituitary irradiation have come from those showing widely disseminated cancer in whom castration, œstrogen therapy and in some cases adrenalectomy had ceased to control malignant activity. Most of the patients were frail elderly subjects, not fit for surgical hypophysectomy, and therefore an attempt was made to induce radio-necrosis of the pituitary. This was encouraged by the success recently claimed in treating advanced hormone-dependent mammary cancer by transnasal implantation of radioactive material into the hypophysis. It is necessary to secure accurate implantation in the pituitary of a source of sufficient strength to produce adequate local necrosis without endangering adjacent nervous structures. Implantation is carried out with the aid of a needle-introducer directed transnasally into the *sella turcica* under radiological guidance. An image-intensifier allows continuous screening for the control of this operation. The most suitable source of radiation is radioactive yttrium ($Y^{90}$). Short rods of yttrium are used, 1·3 millimetres wide by 3·95 millimetres long, with an average activity of four millicuries. This substance emits beta radiation only, and its effect is limited to the immediate vicinity of the source. It is now customary to implant two of these rods, one on each side of the mid-line. Correct implantation is easily confirmed by screening or by films. The method is safe, with little or no complications. The series tested so far is only a small one, consisting of 30 patients; these include a few with advanced mammary cancer as controls. The impression so far is that in most the relief of metastatic pain has been striking, and that in some instances life has been prolonged in comparative comfort. It is doubtful if complete necrosis of the pituitary has ever been achieved, but in some cases hypophyseal activity has been sufficiently reduced to influence the endocrine control of prostatic cancer.

# Medical Societies.

## PÆDIATRIC SOCIETY OF VICTORIA.

THE Jubilee Meeting of the Pædiatric Society of Victoria was held in Melbourne during the week March 11 to 15, 1957. The meeting was opened on Monday, March 11, by the President, DR. J. F. WILLIAMS, who welcomed a distinguished guest, PROFESSOR ASHLEY WEECH, of Cincinnati, Ohio.

### The Memoirs of the Pædiatric Society of Victoria.

DR. H. BOYD GRAHAM read a paper entitled "Footprints: The Jubilee of the Pædiatric Society of Victoria" (see page 201).

DR. R. WEBSTER said that the choice of Dr. Howard Graham to review the history of the Pædiatric Society was a happy and even obvious one. They had all learned to know him as a painstaking and accurate chronicler, meticulous in detail, generous in commendation, and informed and tolerant in criticism. He had a passion for records, revelling in facts and figures, especially if he could reduce them to a graph.

Dr. Webster said that he had been accorded a preview of the "Footprint" fantasy, and had discerned a hiatus in the story which he strongly suspected was a calculated omission. The historian had made no mention of footprints stamped with the monogram "H.B.G." that appeared at the very outset of the trail which, when followed to its conclusion, led to a well-organized diabetic clinic. Identical impressions, with which were mingled those of Robert Southby, were to be observed leading to the arena in which battle was joined with the scourge of venereal disease in children. Howard Graham's institution and conduct of a venereal diseases clinic was an early highlight in his career at the Children's Hospital. As ever, his records were impeccable, and it was a matter of sustained surprise that he could fashion such beautiful graphs from material provided by such a sordid subject. The high standard obtaining in that model clinic receded not one iota with the succession of Robert Southby. The same H.B.G. monogram was to be noted among the many footprints following the trail of rheumatic infection, and might be observed to halt in order the better to study the problem of hydatid disease; the impressions never appeared as the airily light trippings of a dilettante, but invariably as those of a firm and purposeful tread. Of the giants of the past recalled by Howard Graham, Snowball had passed on when he himself entered on what had proved to be a life sentence at the Royal Children's Hospital; but Peter Bennie, A. Jeffreys Wood and Frank Hobill Cole were in active work; the star of Harry Douglas Stephens, destined to become at its zenith the brightest in the constellation, was already high in the firmament. The A. Jeffreys Wood ward and the F. Hobill Cole ward perpetuated, for those familiar with the old witticism, the description of the Royal Children's Hospital as the Carlton wood and coal depot. That had a long life, and indeed was fostered by the two principals.

Dr. Webster went on to say that Dr. Graham had described the nebulous, though in practice effective, relationship which existed between the Pædiatric Society of Victoria and the Victorian Branch of the British Medical Association. One of the expressions of the liaison had been the annual conjoint meeting of the two bodies, staged at the Royal Children's Hospital by a major effort on the part of both demonstrators and registrar-producers. It was in the conditions which obtained at the annual conjoint meeting that he always fancied that Harry Stephens was to be seen at his best. Year after year the room in which Harry was demonstrating filled to capacity very early in the evening. Though never quite at ease in addressing a formal meeting, he delighted in conditions which divested proceedings of all pomp and circumstance. The more rapid the cross-fire of questions, the happier was he. Given some children from whom he could demonstrate concrete clinical points, and a barrage of stimulating questions, he rejoiced as a strong man to run a race. Until approximately the year 1918, the meetings of the Pædiatric Society of Victoria were held in a room known as the Massage Room, situated opposite the northern end of the tennis court, and eventually demolished in the interests of a new out-patient department. Its dimensions were about 18 by 12 feet, and it was furnished with a centrally placed examination couch and wooden forms around the walls. With its tiled floor and lack of heating, that venue for the meetings of the society was as cold as Lapland in the winter months, and inadequate lighting combined with the cold to create an impression of a mausoleum. Nevertheless, some memorable meetings had been held in those Spartan conditions. Dr. Webster said that one occasion that had remained vividly in his memory was that on which Harry Stephens presented several infants in whom the clinical features common to them all led him to believe that they represented an entity, for which he suggested the term "pseudo-pellagra" as appropriately descriptive. In the ensuing discussion Dr. Jeffreys Wood identified the condition with one that had been familiar to Snowball, whom he had often heard refer to "raw beef hands and feet" as one of its conspicuous features. That incident occurred in the interval which elapsed between Swift's presentation of his now classic paper "Erythrœdema" to the Tenth Session of the Australasian Medical Congress held in Auckland in 1914, and its publication in the "Transactions" in 1916. It was interesting to note, in view of the prominence attained by a deficiency hypothesis in the later protracted discussions of the ætiology of the disease, that Harry Stephens in his unrecorded observations should have described it as "pseudo-pellagra". Dr. Webster said that another episode of those early comfortless massage room meetings which was firmly rooted in his memory was that which centred on the radiographic demonstration by Dr. H. M. Hewlett of a fusiform shadow in the spinal canal of a girl regarded clinically as affected with tuberculosis of the spine. X-ray examination during life had failed to confirm the diagnosis of Pott's disease, and Dr. Hewlett asked that a post-mortem radiograph should be taken of the spinal column before it was dissected. Dr. Webster well remembered that post-mortem radiograph, its clear demonstration of the absence of bony disease, the fusiform shadow in the spinal canal opposite the bodies of the eleventh and twelfth dorsal and first lumbar vertebræ; particularly did he recall the excited interest with which Dr. Hewlett correlated the findings on the old-time glass plate, on which pioneer radiologists secured their negatives, with the actual specimen when he (Dr. Webster) showed it in due course at a meeting of the Pædiatric Society. The fusiform shadow to be seen so clearly in the radiograph was that of an intramedullary tuberculoma—a specimen to which he had subsequently erected a memorial in print, and which had held its place in the museum since 1916 to the present day.

Dr. Webster went on to say that the ideal medical meeting was that in which well-chosen subjects were presented in a concise and stimulating manner and discussion was frank and free, so that all participating felt at the end of the evening that they could say with Dr. Johnson: "Sir, we had a good talk!" Informality was the essence of the preponderatingly clinical meetings of the Pædiatric Society during its childhood and adolescence; but a disadvantage was that the chatty character of the meetings was apparently considered by some to absolve them from the preparation essential to the orderly presentation of the case records of the children to be discussed. Free-for-all discussion around an examination couch on which rested a child exhibiting something to be seen or felt characterized the majority of the meetings of the Pædiatric Society during its first two, or perhaps three, decades; but with the institution of the monthly clinico-pathological conference to provide round-the-table talks, the meetings of the Pædiatric Society evolved in a conventional direction. It was a far cry from the sepulchral chill of the old Massage Room, via the more hospitable Board Room, to the well-appointed lecture room of the present day, with its comfortable chairs, air-conditioning and facilities for visual aids. Meetings now ran to a time-table, and reporting of the proceedings operated to ensure that every individual introducing a subject or opening a discussion was on his or her toes, well prepared, with a heart for any fate in the ensuing discussion. *Tempora mutantur* etc.: Times changed and people changed with them, and one could not conceive of a reversion to the period when, all too frequently, a case for discussion was introduced in a series of disjointed statements deciphered with difficulty from the chaotic scribble of an out-patient's card, or projected over the shuffling of the leaves of the clinical notes of a child from one of the wards. Happily there was no reason to fear such a deterioration.

Dr. Webster then said that there had been many notable meetings of the Pædiatric Society, of which time permitted him to recall but a few. The first showing of Howard Williams's colour film on pyloric stenosis; the crowded meeting attended by medical officers of the United States Army at which Howard Williams had reported the great improvement in the results of treatment of meningococcus infection effected by chemotherapy; Kate Campbell's exposition of erythroblastosis, at a time when interest in that subject had been galvanized by the then recent revelation of the role of iso-immunization to the Rh factor; the

dramatic results in the first group of patients to receive penicillin at the Children's Hospital as demonstrated by Elizabeth Turner during her term as Medical Superintendent; in more recent times the demonstration by Alan Williams of hepatic necrosis and other systemic ravages in the neonatal period due to the virus of *herpes simplex*, established as the ætiological agent by Ian Jack in the hospital's own virus laboratory, itself a major advance deriving from the initiative of John Perry; those were only a few of the presentations which had made memorable meetings, and the list could be extended without difficulty far beyond the bounds of permissible time limits. Dr. Webster said that oft in the stilly night he heard the crisp interrogations of Harry Stephens, the quietly reasoned comments of Jock Grieve, the searching questions of Kate Campbell, the reverberations of Colin MacDonald. But while it was pleasant to follow the track winding back, it was not conducive to brevity, and he must therefore refrain from further reminiscence. In conclusion, he assured Howard Graham that he had greatly enjoyed his memoirs, and again expressed his thanks for the opportunity of amplifying them in small measure.

### Cytomegalic Inclusion Disease.

PROFESSOR A. WEECH presented a paper on "Cytomegalic Inclusion Disease". He said that he had chosen the title of cytomegalic inclusion disease, without being certain that it might be of importance in the Antipodes. When he was first graduated from medical school there was no time to think of any of the finer points in pædiatrics, for the summer time was fully occupied in treating the "bloody flux" in infants, the winter with diphtheria. Now there was far less time taken up by the field of contagious diseases than there was some years ago, and one had time to think of other subjects. He said that cytomegalic disease was caused by a virus widely distributed in nature, in animal species, and in various regions of the world. It was an infection which, in infancy and in childhood, in the absence of a secondary debilitating disease, was apparently harmless. However, in the newborn and particularly in premature infants it was a highly lethal disease with wide dissemination.

A study of the saprophytes of older children produced a new science of the infections important to embryonic or fœtal tissue. That was already apparent from the long list of so-called "echo" viruses which had been discovered in the past two years. The word "echo" meant "enteric cytopathogenic human organism". Those viruses had been discovered because of the development of tissue culture techniques capable of growing them from the stools. They were important, because it was as yet unknown what symptoms they would produce and what diseases they were responsible for; but yet it was known that human gamma globulin contained antibodies against those diseases. It might be assumed, therefore, that they were important in the production of symptomatology in the early period of infancy and childhood. It was more correct to consider cytomegalic disease not solely as a description of a single disease, but as a prototype of a group about which generalizations might become possible as knowledge expanded.

Professor Weech said that he would concentrate on a series of clinical pictures which stood out with varying clarity, and would attempt to indicate to the clinician the symptomatology and physical findings which should suggest the condition and permit him to make a definitive diagnosis during life. Similar virus diseases with inclusion bodies, involving the nucleus and the cytoplasm of the cells, were common to practically all the rodents. They were highly type-specific, and it had not been possible to infect rodents with material obtained from human beings or even one type of rodent with material from another. Recently Weller had succeeded in growing the human virus on human foreskin. Human kidneys had also been used, and those techniques had led to the development of neutralizing antibody tests, complement-fixing antibodies being used on the tissue cultures. It had been possible to show significant rises in antibodies to the virus of cytomegalic disease during life. The whole chain of evidence from animal experiment was strong, and there was now corrobation to the point of proof that an ætiological relationship existed.

Cytomegalic disease or salivary gland disease had been reported from the U.S.A., South America, Scandinavia, Europe and China, and the rather curious thing was that over 50% of the cases reported in the literature were from St. Louis, Missouri. Whether the distribution was due to failure of recognition of the disease in some areas was not clear. The disease did not seem to be of widespread occurrence in Melbourne. Dr. A. Williams had shown Dr. Weech one case, which probably meant that more were present and would have to be carefully sought. There was a tremendous amount of divergence of opinion in various pædiatric clinics regarding the incidence of infection with that virus. It had been variously estimated by different authors that anywhere between 10% and 50% of all children coming to autopsy were found to have inclusion bodies in their salivary glands. The vast majority of those children showed no signs anywhere else in the body. One of the difficulties was to determine the factors responsible for the dissemination of a virus which did no harm in the salivary glands, but when it involved a number of organs, could produce a lethal infection. Mere youthfulness was one of the causes, and when the disease occurred in the neonate, it was far more apt to produce disseminating lesions than when it occurred in older children. A high percentage of the neonates affected were born prematurely; that might be due to the transplacental transmission of the virus of cytomegalic disease, or to the fact that a premature infant was unusually susceptible to the infection. Those were points from which it would be wise for a cautious scientist to draw no conclusions at all. There were other debilitating diseases occurring in infants and in older age groups which seemed to predispose the subjects to dissemination of the virus infection, with the production of the symptoms which finally led to the demise of the patient. Those cases were extremely difficult to diagnose correctly.

In describing the pathology of the condition, Professor Weech said that primarily a great many organs in the body might be affected. Characteristically one saw enlarged cells, approximately 9μ in diameter. The enlarged cell was quite clear, and inside the nucleus there was a somewhat eosinophilic staining mass of tissue; often it had begun to contract, forming a halo around the inclusion and separating it from the rest of the cell. The cytoplasmic portion of the inclusion had basophilic stippling, finely particulate under high-power magnification; that strongly suggested that the intranuclear inclusion was itself an altered form of desoxyribonucleic acid resulting from infection with the virus. There was strong evidence that the fine granular stippling found in the cytoplasm represented virus particles themselves. The organs reported to be involved were: salivary glands, kidneys, liver, lungs, pancreas, thyroid gland, adrenals, gastro-intestinal tract, brain, pituitary, meninges, bone marrow, spleen, thymus, lymph nodes, parathyroid, testis, epididymis, ovary, eyeball, heart, skin and blood vessels. Professor Weech then showed a series of slides demonstrating the pathological lesion. He said it was a disease which was protean in its nature and not too selective of the tissues into which it disseminated. In some instances the infection occurred without evidence of an associated inflammatory reaction, but perhaps more commonly there was a focal mononuclear infiltration of the interstitium of the tissue involved. The virus thus produced a reaction which was difficult to distinguish from secondary infection superimposed on an irritative phenomenon. Necrosis as a result of the virus infection had been described only in the brain with any frequency, and when the virus involved the brain, necrosis was the lesion to be expected, the lung had some exudate in the alveoli with giant cells showing the intranuclear inclusion, and a salivary gland showed the same features. Inclusion bodies had been seen projecting into the lumen of the renal tubules and also into the alveoli of the lung, and might be cast off. In cases of that kind, it might be possible to find the typical cells in urine and bronchial washings.

Professor Weech then briefly described illustrative cases. The first was that of a white male infant, who had weighed four pounds ten ounces at the time of birth on August 5, 1955. The baby died three days after birth, so the process was a fulminating one. The mother was a housewife, aged 18 years, who on January 7, 1955, had had an olfactory neuroblastoma removed from her right antrum. She received a unit of whole blood at that time. Her blood was group A, Rh-positive, and serological tests for syphilis gave negative results. Quickening was noted in April, and the estimated date of confinement was September 2, so that the baby appeared three to four weeks prematurely. At the time of birth the infant's condition was thought to be satisfactory, but very shortly thereafter mild but inconsequential cyanosis was recorded. Within a matter of hours the baby became lethargic, jaundiced and œdematous, and developed innumerable cutaneous petechiæ. The liver and spleen were enlarged two fingers' breadth beneath the costal margin. The direct Coombs test produced a negative result, and both mother and child were Rh-positive, and there was no evidence of an iso-immunization phenomenon. The baby's serum bilirubin level rose rapidly in that three-day period, from nine to thirty milligrammes per 100 millilitres. Of the total bilirubin in the initial sample, 1·25 milligrammes per 100 millilitres were of the directly reacting type, and of the

later sample 20 of the 30 milligrammes were of the directly reacting type. That spoke strongly of an active inflammatory process in the liver. Such a rise was seen in cases of protracted erythroblastosis; but a progress so rapid as that would be an uncommon phenomenon in that disease. Professor Weech said that the baby had been treated with exchange transfusions, as it was his practice to treat any baby with a serum bilirubin level which rose above 20 milligrammes per 100 millilitres. Penicillin and streptomycin and vitamin K were administered. The infant developed rapidly increasing signs of severe respiratory disease, with irregular respirations, and terminally had a massive hæmatemesis. A triad of symptoms emerged—hepato-splenomegaly, jaundice and hæmorrhagic phenomena. All those things could occur in iso-immunization, but all tests for that gave negative results. At autopsy there were severe hæmorrhages in the lungs, where there was also some evidence of aspiration of amniotic fluid. There were extensive necrosis, bile duct proliferation and bile stasis in the liver. The gastro-intestinal tract contained bloody mucoid material. There was extensive extramedullary hæmatopoiesis in the spleen, together with focal interstitial nephritis, pneumonitis and extensive meningo-encephalitis. That baby's severe lethargy seemed to be related to the presence of lesions in the brain. Under the microscope, inclusions were found in the brain, liver, kidney, lung and thyroid gland.

The second case was that of a male baby, aged four months when he was first admitted to the Children's Hospital in Cincinnati in August, 1951. He had had an upper respiratory infection for two weeks, with gastro-intestinal symptoms characterized by vomiting, constipation and foul stools. He had been the product of a full-term delivery and the neonatal period was normal. On his admission to hospital, there was a diffuse papular eruption over the abdomen with hepato-splenomegaly. The rash intensified, and was attributed to one of the drugs being administered; that may have been its cause. The respiratory symptoms increased in severity. Antibiotics and sulphonamides were administered, and he was discharged from hospital, but later readmitted with severe respiratory illness, which was fatal. Professor Weech said that in this case, prior to the infant's death, a liver biopsy had been performed because of the increasing size of the liver, and the diagnosis had been made from that. Inclusions were found in the pancreas, in Brunner's glands in the small intestine, in the colon and in the kidney. In the salivary glands and in the intestine they were associated with foci of chronic inflammation.

The third case was similar to the first one described. Jaundice developed within 24 to 36 hours after birth, and lethargy, a weak cry, hepato-splenomegaly, petechiæ and a poor Moro response were all part of the clinical picture. The baby died, and at autopsy the findings were subacute nephritis, reticulo-endothelial hyperplasia and areas of encephalo-malacia with perivascular gliosis. Inclusions were found only in the pancreas and kidney. There was no record of a Coombs test having been performed and no proof that the mother's being Rh-negative and the baby Rh-positive played any part in the symptomatology.

The fourth case was that of a premature baby, who had been first examined at the age of three days. The baby had been born with a goitre. Dr. Weech said that Cincinnati was in a goitrogenic belt in Southern Ohio, and that all the salt was iodized. It was almost impossible to get a goitre, but the baby under discussion had one at a very early age. A test for protein-bound iodine was performed, and the result was found to be low. The serum alkaline phosphatase content was reported as two Bodansky units. Desiccated thyroid, one-fifth of a grain, was given daily, but the baby did not do well. Respiratory signs developed, and it became pale, dehydrated and acutely ill, and died. The intranuclear cytoplasmic inclusions were found in the epithelial cells of the œsophagus, kidneys, lungs, liver and adrenals. The disease began in the newborn period and progressed in the course of two months to a lethal outcome. One of the things which often defeated the doctor's purposes in clinical medicine was the desire to have neat pigeonholes, which included only one diagnosis, and into one of which every case would neatly fall. It was possible that if the baby under discussion had not had cytomegalic disease, thyroid therapy might have been successful, and if it had not had cretinism, perhaps the dissemination of the virus would not have taken place.

The fifth case was that of a white male infant, who had died at the age of three and a half months with severe dehydration resulting from intestinal obstruction. A malformed pylorus, bilateral hernia of the liver through the foramina of Morgagni and malrotation of the intestine were present. Inclusion bodies were found in the epithelium of the renal tubules, but nowhere else.

The sixth case was that of a child with congenital heart disease who had died of congestive heart failure. Again, only in the renal tubules were the viruses found. In all probability the infection with cytomegalic virus was not disseminated and had nothing whatever to do with the death of the infant.

Professor Weech said that that was a typical series of cases, which extended from a fulminating infection in the newborn to an infection in the older infant in which respiratory and gastro-intestinal symptoms were prominent, and finally to a group in which diagnosis could be exceedingly difficult, often incidental. A classical case was then summarized, in the following terms. A premature infant was noticed to be icteric within the first 24 hours of life. Hepato-splenomegaly was found when the abdomen was palpated, and at that time or within a few hours innumerable cutaneous petechiæ appeared. Lethargy and respiratory distress soon developed and rapidly progressed in severity. Laboratory studies failed to reveal blood group incompatibility with the mother, and serological tests for syphilis gave negative results. Anæmia, probably hæmolytic, and thrombocytopenia were demonstrated by routine blood examinations, whereas the white cell count was normal or elevated. Cerebral calcification might be noted from X-ray films, and inclusion-containing cells from the renal tubules might be found in the urinary sediment. Central nervous system depression with signs of pulmonary parenchymal disease progressed, and the infant died within hours or days, having failed to respond to supportive therapy including the exhibition of antibiotics. Post-mortem examination confirmed the clinical findings and revealed hepatic necrosis or cirrhosis, focal and interstitial pneumonitis, nephritis, and granulomatous, necrotizing and calcifying meningo-encephalitis. Increased extramedullary hæmatopoiesis was found in the liver and spleen, and typical inclusions were found in the brain, thyroid, kidney, liver, lungs and pancreas. Not in all cases were all those findings present.

The differential diagnosis included erythroblastosis and visceral *herpes simplex*, which should be considered when, in addition to the syndrome described, the mother had fever in the immediate ante-partum period, and particularly when she was known to have had an infection with *herpes simplex*. The central nervous system manifestations and the cerebral calcification found in salivary virus disease rarely occurred with the hepato-cranial necrosis of disseminated *herpes simplex* infection. Staphylococcal sepsis could simulate the neonatal form of inclusion disease, and infants with that clinical pattern undoubtedly should be treated with antibiotics. Without blood culture to exclude sepsis, it was sometimes difficult to distinguish from erythroblastosis. Hepatitis and toxoplasmosis rarely produced a bleeding tendency, though toxoplasmosis could produce similar cerebral calcifications, but it was rarely fulminating in its course. It was worth noting that diagnosis could be made by finding the characteristic cells in the urine. There was also the fact that examination of a lobectomy specimen for pulmonary cysts led to the diagnosis in one case. Liver biopsy in a case of unexplained hepatomegaly and examination of the subdural fluid had led to the correct diagnosis, as had aspiration of material from the bronchial tree. All those methods might be used to obtain the typical cells.

Professor Weech, in summary, said that there were four main categories of inclusion disease: (*a*) that occurring in the neonatal period, which was easy to recognize; (*b*) that occurring in older infants, in which suspicion was aroused by the occurrence of respiratory and gastro-intestinal symptoms together, but which was much more difficult to recognize clinically; (*c*) a third type in which an important debilitating disease had allowed a virus that might have remained latent to become disseminated to produce serious symptoms; (*d*) finally a type in which the virus was found in a patient dying of some other disease, and in which its importance was unknown.

Professor Weech then showed slides which demonstrated the findings in a group of cases collected by one of his resident physicians, Dr. Madiras; they had been collected from the literature as well as from the hospital, and numbered 130 in all. The first slide showed the clinical and pathological characteristics of 42 neonates with visceral human salivary gland virus inclusions. In that group 23 were premature, 30 showed jaundice, 26 showed liver and spleen enlargement, 31 had an hæmorrhagic diathesis and 16 had central nervous system signs. Of 81 patients in the older age group, only four showed jaundice, one hepato-splenomegaly and one an hæmorrhagic diathesis. In a group of 25 patients showing central nervous system disorders and

visceral and salivary virus inclusions, 10 had inclusions in the brain, 14 had encephalitis or ependymitis, two had bacterial meningitis and two had hydrocephalus. Of 75 patients aged over one month, 24 showed interstitial pneumonitis, 20 bronchopneumonia and 31 pertussis. As in most other virus diseases, the common type of pneumonia was interstitial pneumonia. A summary of the 130 of infection indicated that there were 38 of the fulminant neonate type, and 13 of primary pulmonary disease. Eight of the subjects had central nervous system disorders, 31 had pertussis, six were stillborn, four had syphilis, nine had fibrocystic disease of the pancrease, and there were 23 others.

DR. A. WILLIAMS referred to an infant, aged four months, who had died with the clinical symptoms of fibrocystic disease of the pancreas, confirmed by autopsy. On microscopic examination the picture of cytomegalic inclusion disease was also seen involving the kidneys, salivary glands, pancreas and lungs. He had looked for the disease in 1500 pancreases, but had not found it. He had also examined about 24 salivary glands with no evidence of it.

DR. KATE CAMPBELL asked Professor Weech two questions: firstly, whether there was any evidence that the disease resulted in intrauterine death; secondly, whether any changes in the placenta had been observed.

Professor Weech said that he did not know of any changes in the placenta. The disease was reported in stillbirths, but whether the disease caused the stillbirth was a matter of conjecture.

DR. V. COLLINS asked whether any cases of hepatosplenomegaly with recovery had been recorded.

Professor Weech said that as yet there were no cases that could go in that group. Both histoplasmosis and toxoplasmosis produced those manifestations, and now the disease of *herpes simplex* should be included.

DR. J. COLEBATCH said that in Adelaide Dr. M. Fowler had found two cases, and in Brisbane another two cases had been found. He knew of no cases that had been suspected on clinical grounds in Melbourne, but one child had been examined in Melbourne and had then gone to Sydney, and the diagnosis had been made there. He thought that more of that infection might be found if they looked for it. They had seen in Melbourne a number of cases of *herpes simplex* viræmia. There were a few points about those which were different; for instance, no patients with herpes presented symptoms before the third or fourth day of life; no stillborn fœtuses were affected, and no patients had intracranial calcifications.

Dr. Colebatch asked Professor Weech whether, as the gamma globulin level was so low in the newborn, there was any place for its use in the treatment of inclusion disease.

Professor Weech said that there was no proof that anything could be done with gamma globulin, but it would be the logical thing to try if one came across a case of the disease. Now that there were techniques for identifying antibodies in blood, it might become possible to produce a special gamma globulin against the virus.

DR. ELIZABETH TURNER asked, first, whether examination of the bone marrow was of value during life in the detection of the disease; secondly, whether any necrosis had been observed in cells in the basal ganglia, giving rise to any sequelæ like kernicterus; and thirdly, whether in any cases plasma cell pneumonia had been found.

Professor Weech said that he know of no record indicating that bone marrow was of diagnostic use, and of no record that changes had been seen in the basal ganglia. In none of the cases had plasma cell pneumonia been found.

## Symposium on Neonatal Jaundice.

DR. KATE CAMPBELL read a paper entitled "Jaundice of Prematurity" (see page 206).

DR. ELIZABETH TURNER then presented the results of a two-year investigation undertaken at the Queen Victoria Memorial Hospital, Melbourne, into the management of infants suffering from neonatal jaundice attributable to incompatibility between maternal and fœtal blood groups in respect of both the Rh and ABO factors. She said that 121 infants suffered from erythroblastosis, 101 owing to Rh incompatibility, and 18 owing to ABO factors; in two the incompatibility was undetermined. Dr. Turner said that premature induction of labour might be considered (preferably after the thirty-fourth week of gestation) in the case of any immunized woman who manifested toxæmic symptoms, especially if she complained that she did not feel that the fœtus was "well". Gestation in immunized women, particularly if there had been a history of a previously affected infant, was not allowed to proceed beyond 40 weeks, because of the risk of placental insufficiency and fœtal hypoxia. Seven affected infants had been treated with simple transfusions only. One hundred and fourteen affected infants received exchange transfusions, and in some cases repeated exchange tranafusions, and a full follow-up survey of those children had been undertaken for a period of up to two and a half years. Only one child exhibited evidence of kernicterus, and that child had been referred to the hospital on the seventh day of life with established involvement of the central nervous system. Four other infants had had abnormal central nervous system symptoms in the neonatal period, and three had later developed febrile convulsions. Two of those children, while physically and intellectually normal according to all tests, were said to be developing at a slower rate than their siblings.

Dr. Turner stressed the importance of early exchange transfusion for affected infants, and stated that the predominant and most urgent indication for the prompt institution of such therapy was jaundice within the first 24 hours of life.

DR. RACHAEL JACOBOWITZ, of the Red Cross Blood Transfusion Service, continued the discussion on neonatal jaundice due to erythroblastosis fœtalis. She referred to a hospital series of 9277 deliveries, in which 57 babies (0·6%) suffered from hæmolytic disease of the newborn severe enough to warrant exchange transfusions. In 45 of those 57 cases fœtal damage was due to Rh incompatibility, in the remaining 12 most likely to ABO sensitization. Among the 9277 deliveries there was a potentially dangerous Rh incompatibility between mother and child in 897 cases (approximately 10%) and a similar ABO incompatibility in 1728 (19%). In the Rh series 80 women (approximately 9%) and in the ABO series 209 women (approximately 12%) had immune antibodies antagonistic to the child's blood-group antigen.

Dr. Jakobowicz went on to say that Rh sensitization had made exchange transfusions necessary in 0·5% of all deliveries of that series or in 5% of the deliveries in all Rh-incompatible pregnancies, and if the mother had immune antibodies, that figure rose to 56%. The corresponding figures for ABO exchange transfusions were 0·1%, 0·7% and 5·7%. In the Rh-incompatible pregnancies in which the mother had Rh-antibodies, seven infants had *hydrops fœtalis* or were macerated, 45 needed exchange transfusions, four recovered after one simple transfusion, and 24 did not require any treatment. In 817 (91%) of the 897 Rh-incompatible pregnancies, there was no serological or clinical evidence of sensitization.

Discussing the effects of incompatibilities associated with the ABO system, Dr. Jakobowicz said that 451 (4·8%) of 9277 women had immune anti-A and/or anti-B antibodies. Of those 451 women, 242 (54%) had children whose blood groups were compatible with the maternal group, and 209 (46%) had children with incompatible blood groups. Exchange transfusions were necessary in 12 cases—0·1% of all pregnancies, or 5·7% of all pregnancies in which the mother had immune anti-A and/or anti-B antibodies. All 12 mothers were of blood group O, nine children were of group A, three were of group B. The incidence of ABO incompatible pregnancies was approximately 19% in the total series of 9277 deliveries, and 46% in the series of 451 in which the mother had immune antibodies of the ABO system. Those antibodies were as a rule demonstrable at the woman's first visit to the ante-natal clinic.

DR. T. MADDISON discussed the rare causes of neonatal jaundice. He said that congenital syphilis and ascending infection along the cord or portal tract were now rare causes of liver damage and therefore jaundice. The snuffly, anæmic, jaundiced infant with the odd maculo-papular rash, enlarged liver and spleen, who was failing to thrive, might still be seen. In a recent study of 32 cases of infant hepatitis, Robert Peace had found three cases of bacterial hepatitis following umbilical or portal infection. In Melbourne, non-suppurative hepatitis was far commoner than atresia of the bile ducts as a cause of neonatal obstructive jaundice. Dr. Maddison said that the virus of homologous serum jaundice was the commonest cause of neonatal hepatitis, and was transmitted across the placenta in mothers who were silent carriers of the virus. The clinical picture was characterized by the early onset of jaundice (in the first week or weeks of life), acholic stools, bile-stained urine and moderate hepatosplenomegaly. Some infants died suddenly, some developed cirrhosis, but most recovered without sequelæ after a prolonged period of jaundice. It was that group in which the differential diagnosis from bile-duct atresia was difficult and often impossible without exploration. The babies stood

surgical procedures poorly. All writers on that subject recognized that difficulty, and advised a period of investigation and observation before surgery. Dr. Maddison said that fatal hepatic necrosis could be caused by the *herpes simplex* virus. At the Royal Children's Hospital, two cases had been recognized. The source of infection could be genital herpes in the mother or oral herpes in one of the attendants. He emphasized that such attendants should be excluded from nurseries for the newborn. The clinical picture was one of insidious onset a few days after birth with tachycardia and pyrexia often associated with jaundice. Respiratory and hæmorrhagic symptoms often developed in association with a rapid terminal decline several days later. Generalized cytomegalic inclusion disease was another virus disease which could produce a clinical picture resembling *erythroblastosis fœtalis*. In the first week of life the clinical picture was usually that of a jaundiced premature infant with an enlarged liver and spleen, purpura with associated thrombocytopenia and hæmorrhagic symptoms.

Dr. Maddison then mentioned congenital toxoplasmosis, a protozoal infection derived from the mother. He said that the clinical picture in adults resembled that of glandular fever and was usually unrecognized. The congenital disease might simulate *erythroblastosis fœtalis* in the early days, but chorio-retinitis, intracranial calcification, hydrocephaly or microcephaly developed in the ensuing weeks. The diagnosis was made by demonstrating the parasites in the tissues or body fluids and by the dye test or complement-fixation tests on the infant's and mother's serum. Subsequent infants were not affected. He said that surgical conditions causing obstructive jaundice in neonates were not common. Atresia of the bile ducts was the most important. Unfortunately in only 20% of cases was the condition operable. The jaundice did not appear until late in the first week and progressively deepened to a greenish-bronze colour. After the passage of meconium, the stools became greyish-white in colour and the urine deeply bile-stained. Surgical exploration was indicated after various tests had excluded other causes; firstly, bile was absent from the stools and duodenal secretions; secondly, urobilinogen was absent from the urine; thirdly, the serum direct bilirubin level was not falling. Even with laboratory aid the diagnosis from hepatitis was not always certain.

Dr. Maddison then said that congenital choledocal cysts (or cysts of the common bile duct) were usually found in older children. The classical triad of findings were an abdominal mass, obstructive jaundice and abdominal pain. A patient Dr. Maddison had observed presented in the first week of life with persistent vomiting similar to that resulting from a partial obstruction. That subsided in a few days, and obstructive jaundice gradually developed, followed eventually by cholangitis. The jaundice was fluctuating and was not quite complete, galactose was found in the urine, and the diagnosis was finally made at autopsy. Rarely a cyst or tumour near the common bile duct caused obstructive jaundice by external pressure. One interesting association which had been described was of obstructive jaundice with congenital pyloric stenosis. An unusual angulation of the pyloric tumour caused pressure on the common bile duct sufficient to produce jaundice, in addition to the signs and symptoms of pyloric stenosis.

Dr. Maddison went on to say that galactosæmia was an hereditary inborn error of metabolism. The affected infants became jaundiced in the first week of life, often vomited and always failed to thrive. He mentioned one patient transferred from the country, who had dropped from a birth weight of ten pounds two ounces to seven pounds thirteen ounces at ten weeks. In those cases the liver enlarged, a reducing substance (galactose) was found in the urine, and the patients often developed cataracts. Dramatic improvement and normal development resulted from a galactose-free diet, if commenced early enough.

Dr. Maddison mentioned a family described by Dr. Elizabeth Turner, in which there were four cases of congenital familial non-hæmolytic jaundice. The ætiology appeared to be a functional inability of the liver to excrete bilirubin, which accumulated as the indirect form in the body. All other tests gave negative results. That usually resulted in kernicterus and early death. The last child had been successfully treated by two exchange transfusions, on the eighth and seventeenth days, to lower the serum bilirubin level. He had remained well, although still jaundiced, and showed no evidence of kernicterus. Scandinavian authors had pointed out an interesting association between cretinism and prolonged physiological jaundice. That preceded the clinical picture of cretinism, which was usually not present until at least the age of three months. That prolonged jaundice persisted for six to eighteen weeks, all tests gave negative results, and it could divert attention from the developing picture of congenital myxœdema. Persistent jaundice and hepatosplenomegaly had also been reported in thyrotoxic infants born of thyrotoxic, exophthalmic mothers. Occasionally infants with a hæmorrhage, such as a subdural hæmatoma or cephalohæmatoma, had a deeper, more persistent jaundice than expected. That was presumably from the added load of bilirubin from the hæmoglobin breakdown in the hæmorrhage. Acholuric jaundice, leuchæmic and hereditary non-spherocytic hæmolytic anæmia were all extremely rare, but had been reported with jaundice in the neonatal period.

Dr. Maddison showed the bilirubin figures in a case of obstructive jaundice following severe erythroblastosis due to the Rh factor. He said that although the condition was sometimes called the "bile inspissation syndrome", it was probable that the biliary obstruction followed swelling of damaged liver cells. It appeared in a small percentage of erythroblastotic infants. The prognosis was good, although the jaundice was prolonged, and that child had developed normally. The direct bilirubin was not likely to damage the brain as did high levels of indirect bilirubin in the neonatal period. Dr. Maddison finally said that there were still many cases of neonatal jaundice in which as yet unknown factors were operating either on the production of bilirubin from the red cell or on the excretion of bilirubin by the liver cell.

DR. J. PERRY referred to the efficiency with which the liver could excrete bilirubin resulting from the normal decay of red cells, and quoted a statement from the work of Weech *et alii* that a newborn infant, if his liver was functioning at adult level, could excrete in 15 minutes all the bile pigment he produced daily. Dr. Perry said that that work served to emphasize that, whilst in hæmolytic disease excessive breakdown of red cells presented the liver with a greater burden, at that stage of the infant's life liver function was only a fraction of its adult efficiency.

Dr. Perry then discussed the views concerning damage to the brain in hæmolytic disease of the newborn, and mentioned the work of Lathe, who demonstrated the presence of lipide in the brains of newborn children which had a great affinity for indirect-reacting bilirubin. Some recent work showed that bilirubin interfered with cell metabolism at the coenzyme 1 level.

Dr. Perry emphasized that, after exclusion of hæmolytic disease of the newborn, virus hepatitis was probably the commonest cause of jaundice in the neonatal period. Virus hepatitis could be easily confused with galactose intolerance, especially jaundice, galactosuria and amino aciduria. It was important, therefore, if a diagnosis of galactose intolerance was made and improvement occurred after removal of milk from the diet, to remember that a similar improvement could occur in hepatitis. A galactose tolerance curve could be useful to establish with certainty a diagnosis of galactose intolerance.

Dr. Perry finally said that it was unwise to accept without reserve the inspissated bile syndrome as a complication of hæmolytic disease of the newborn, for when direct bilirubin rose to unusual levels in that disease, it was a good idea to think of the other causes of jaundice simulating obstruction in that group, including infective hepatitis and other virus causes of liver damage.

Dr. Maddison said that in the Scandinavian literature, cases of cretinism had been described in which prolonged jaundice had been present. That had been confirmed by the estimation of serum bilirubin levels.

Dr. Campbell said that the observations of vigour in a premature infant were very personal ones, and could be assessed only by watching the baby each day and noting changes.

DR. E. CORDNER asked Dr. Turner how often the maternal antibody titre should be estimated during pregnancy.

Dr. Turner, in reply, said that the titre should be estimated at the first ante-natal visit. If antibodies were present, the titre should be estimated once a month. If antibodies were not present at the initial examination, they should be looked for again after six months. After the thirtieth week of the pregnancy, antibody titres should be estimated every two weeks in those cases in which antibodies were present. Dr. Turner regarded a twofold rise in the antibody titre as a sudden rise; but in deciding what action to take, she was very much influenced by the mother's statement that all did not seem to be well with the fœtus. The decision to induce labour was also influenced by the presence or absence of evidence of toxæmia.

PROFESSOR L. TOWNSEND said he thought that understanding of the significance of maternal antibody titres was still

incomplete. Likewise the wisdom or otherwise of induction of labour was still uncertain. At the Royal Women's Hospital that was now being done at 34 weeks, and he thought that would produce better results. Recently in his unit the practice had been introduced of estimating before the confinement the bilirubin content of the *liquor amnii*, and he was hopeful that the information obtained would prove useful.

Dr. Turner, in reply, said that although the actual levels of maternal antibody titre were of doubtful significance, changes in those levels, and in particular sudden rises near the end of pregnancy, were of great importance.

DR. J. MATTHEWS (Auckland) commented on the variation in the incidence of severe jaundice in premature infants in various parts of the world. He said that in Auckland the incidence was low. In only six of 300 premature infants studied had the level been greater than 18 milligrammes per 100 millilitres. He wondered what was the lowest bilirubin level capable of producing central nervous system damage in premature infants. In full-term infants, if the serum bilirubin level was between 18 and 24 milligrammes per 100 millilitres, the risk of kernicterus was about 8%. If the bilirubin level was between 24 and 29 milligrammes per 100 millilitres, the risk was between 25% and 33%, and with levels of over 29 milligrammes per 100 millilitres the risk was about 78%. He had not seen figures quoted for premature infants.

Dr. Campbell said that the incidence of jaundice varied from clinic to clinic according to the type of management adopted—for example, in regard to hydration. The bilirubin level at which kernicterus was apt to develop depended not only on the level itself, but also on the state of the infant's brain. The less mature the baby, the lower the level of serum bilirubin at which kernicterus was likely to develop. She had seen it develop with a bilirubin level of only 12 milligrammes per 100 millilitres. The risks of leaving the pre-kernicterus infant were very worrying. Sometimes the decision to carry out exchange transfusion was determined by the practical ease or difficulty of its performance in the particular baby, and by the experience of the medical personnel.

Professor Weech asked Dr. Matthews how often the serum bilirubin levels had been estimated in the cases to which he had referred.

Dr. Matthews, in reply, said that micro methods had been used, and that in some cases estimations had been made as often as four times in 24 hours.

Professor Weech agreed with Dr. Campbell about the differing figures for bilirubin levels found at various centres. Nevertheless, he found it difficult to explain figures found in New Orleans, where the bilirubin levels in premature and full-term infants were apparently identical. In Cincinnati, of 100 premature infants (all weighing less than 1800 grammes) 40% had bilirubin levels greater than 20 milligrammes per 100 millilitres. All those infants had been given too much vitamin *K*, although he did not know how much too much. At present he regarded 25 milligrammes per 100 millilitres as the critical serum bilirubin level above which exchange transfusion should be carried out. That figure was possibly too high, but in view of the labour involved in exchange transfusions some arbitrary figure had to be chosen. He had found that every infant who had a serum bilirubin level of 12 milligrammes per 100 millilitres or more at the age of 12 hours invariably had a level exceeding 20 milligrammes per 100 millilitres during the next three days. He recognized a group of "late climbers", in which the peak bilirubin level was not reached until the fifth, sixth, seventh, eighth or even ninth day. The incidence of kernicterus in that group was low, but possibly that was only because the incidence of "late climbers" was itself low.

Dr. Matthews asked Dr. Perry what was the range of error in the estimation of serum bilirubin levels.

Dr. Perry, in reply, said that the experimental error in bilirubin estimations in his laboratory was about 5%.

### Changing Aspects in Pædiatric Orthopædics.

DR. D. GALBRAITH read a paper entitled "Changing Aspects in Pædiatric Orthopædics" (see page 208).

DR. S. WILLIAMS asked whether there had been any cases of Still's disease in the past five years.

Dr. Galbraith, in reply, said that there had been some, but less than usual. They were included in the "general arthritis" group.

DR. E. PRICE said that certain of the trends indicated needed analysing. The incidence of tuberculosis of bones and joints was certainly decreasing, and the Mantoux test had become of increased value. If the result was positive; it was more likely to refer to the lesion under discussion. There always seemed to be a hard core of cases of osteomyelitis at Frankston, and resistance of staphylococci to antibiotics was rising. Some of the trends in the groups of diseases were really determined by the availability of beds. As some diseases decreased, then beds became available for other types of disease so that the incidences were not always true ones. That applied to the large proportion of cases of talipes in more recent figures. Dr. Price said that he was interested in the group of cases of non-specific arthritis; he thought that that condition had increased almost to an epidemic.

### What Can We Do for the Child who Bleeds?

DR. J. COLEBATCH read a paper entitled "What Can We Do for the Child who Bleeds?" (see page 210).

DR. ELIZABETH TURNER asked Dr. Colebatch for his opinion on the judicious use of steroids in hæmarthroses.

Dr. Colebatch, in reply, said that they would limit the formation of fibrous adhesions, but he did not advocate their wide use.

DR. J. SAWERS referred to Cohn's fraction. He said that it was not regarded highly because of variation of potency. It was better to use fresh plasma, which was very carefully prepared by the Red Cross Blood Transfusion Service. Dr. Sawers also referred to the use of serum in Christmas disease, and said that in the Commonwealth Serum Laboratories, all the Christmas factor had been removed by filtration. It was better to give bank blood or the plasma from a bottle of blood.

### Neuroblastoma with Spontaneous Recovery.

DR. V. COLLINS presented the details of a patient, aged almost nine years at the time of the meeting, who had made an apparently spontaneous recovery from an adrenal neuroblastoma appearing in the neonatal period. The boy was a seven weeks premature infant with a birth weight of four pounds eight ounces. At the age of three weeks it was noticed that his abdomen was increasing abnormally in size. The enlargement continued over the next two weeks, and he was admitted to the Royal Children's Hospital on May 28, 1948, at the age of five weeks. Examination of the baby at that stage revealed a large mass filling almost the whole of the abdomen. It was thought to be due mainly to an enlarged liver, and the liver edge was palpable half-way between the umbilicus and the *symphysis pubis*. Radiological examination of the child on June 1 revealed an homogenous opacity involving the whole of the right upper quadrant of the abdomen continuous with the liver shadow. No calcification was seen. The lung fields were normal and the bones were radiologically normal. The blood failed to react to the Wassermann test, a full blood examination gave normal results, and there was no jaundice. On clinical grounds there seemed no alternative to a diagnosis of malignant abdominal tumour with liver metastases—probably a neuroblastoma. On June 15 liver biopsy was performed by needle aspiration. Dr. Perry reported that liver tissue was present in small quantity, and the bulk of the tissue consisted of masses of polyhedral cells in a fine, collagenous, extremely vascular stroma. The liver tissue consisted of masses of polyhedral cells in a fine, collagenous, extremely vascular stroma. The liver tissue was infiltrated by that neoplastic tissue, in which in some parts there was a suggestion of rosette formation. He concluded that the histological diagnosis was that of a malignant neoplastic infiltration of the liver—probably a neuroblastoma.

Dr. Collins went on to say that the baby appeared to present a hopeless problem at that stage. At the end of the third week in June, the patient became dyspnœic from the pressure effects of the large abdominal mass. At the beginning of July, œdema of the legs appeared (secondary to raised intraabdominal pressure) and he was more dyspnœic. He collapsed on one occasion. The nursing staff continued to maintain a high standard of care; the medical staff expected to hear of the child's demise at any moment. However, at the end of the second week in July he appeared a little better, and one week later there was no doubt about his improvement. The œdema of the legs was subsiding, he looked much better, and after another week there was no doubt that his abdomen was becoming smaller. By the middle of August he appeared remarkably well, and the liver edge was above the level of the umbilicus. Improvement continued, and when he was discharged from hospital on October 5, the liver was enlarged only two fingers' breadth, and he weighed 10 pounds.

The patient was examined regularly in Dr. Collins's follow-up clinic over subsequent years, and improvement was maintained. He developed as a normal boy. The liver edge was palpable one to two fingers' breadth below the right costal margin for some years, but had been impalpable over the last two years. In 1955 the child suffered from a mild attack of infective hepatitis. Dr. Collins showed a recent photograph of the patient, aged eight years and eleven months. He was a boy of average size, active and well. A recent radiological examination of the abdomen had revealed an area of calcification below the right side of the diaphragm. Tomography and an intravenous pyelography demonstrated that that area of calcification was situated anterior to the right kidney at the level of the upper calyces and therefore unlikely to be in the right adrenal gland. It presumably could represent calcification in a previous area of hæmorrhage or necrosis in the liver. Liver function tests had recently been performed, and the results were normal.

Dr. Collins said that it appeared that the patient had made a spontaneous recovery from a right suprarenal neuroblastoma with metastasis in the liver. Such an outcome had been reported many times in the literature, and it appeared desirable to present the patient merely to emphasize the possibility of such an outcome. Since Cushing and Wolback in 1927 had reported the first case of prolonged recovery, there had been many reports of recoveries, including many cases in which the liver was metastatically involved. More recently there had been a few reports of remissions and apparent recoveries in patients with secondary involvement of bones. Farber, in 1940, had been the first to emphasize that "permanent cures" could occur in neuroblastoma patients. He had pointed out, in a study of 40 patients, that a neuroblastoma might undergo spontaneous hæmorrhage or necrosis, disappearing without treatment, and that the tumour might also undergo spontaneous maturation by becoming a benign ganglioneuroma. Wittenborg in 1950 had continued that study of neuroblastoma patients at the Boston Children's Hospital, emphasizing the value of radiation therapy. He found that 22 of 73 patients were alive three years or more after diagnosis, and that of 21 patients with liver metastasis who had received deep X-ray therapy, six had survived for three to twelve and a half years. Three children who had received no therapy had survived for long periods. Two were still alive 12 and 16 years after diagnosis, but one had died from secondary deposits 10 years after the original diagnosis. Dr. Collins pointed out that that would indicate that the patient he was discussing was not yet out of danger. There were other large reported series of patients with a 30% survival for three years or more after radiation therapy. Horn, Koop and Kieswette, studying survivals following surgical treatment only, emphasized that the prognosis was much better when neuroblastoma was first diagnosed under the age of six months.

Dr. Collins then said that at the Royal Children's Hospital, over the last 10 years 18 patients had been diagnosed as suffering from neuroblastoma. The patient under discussion represented the only long-term survival. It was interesting to record that another patient, in whom neuroblastoma was diagnosed at the age of six weeks when he presented with progressive hepatic enlargement, had a spontaneous remission for seven months without treatment. At the end of that time he appeared a healthy baby weighing 25 pounds, and the liver edge, previously well below the umbilicus, was now only one finger's breadth below the right costal margin. Eleven months after his first admission to hospital his condition had again deteriorated with features of a left abdominal tumour, and death followed. At necropsy a large neuroblastoma was present. Dr. Collins said that it would be interesting to know of the present health of the neuroblastoma patients reported over the past 10 years as having survived for 10 to 16 years. He did not wish to elaborate upon the role of radiation, surgical or vitamin $B_{12}$ therapy, which was difficult to assess in a condition in which there were often spontaneous remissions, though the results from the Boston Children's Hospital indicated the definite value of radiation therapy.

### The Treatment of Staphylococcal Infection.

DR. S. WILLIAMS discussed the treatment of staphylococcal infection. He said that good results were usually obtained in the treatment of the commonest infections due to the *Staphylococcus aureus*, especially in those infections that were accessible and observable, such as boils and carbuncles. Apart from the fact that local treatment might play quite a part in their cure (for example, incision and drainage of a boil or carbuncle), the organism in those infections had a 60% to 80% chance of being sensitive to penicillin and a 90% chance of being sensitive to tetracycline. If the organism causing that infection had not arisen in a hospital, and was therefore not resistant to commonly used antibiotics, there would be a 95% chance of its being sensitive to erythromycin and novobiocin. Though good results could often be obtained with penicillin, either by injection or given by mouth in the form of crystalline penicillin G or penicillin V, the use of a broad-spectrum antibiotic (for example, tetracycline) in the dose of 10 milligrammes per pound of body weight per day, was good routine therapy. Streptomycin was useful in that it would be given by injection, but always carried the risk of vestibular nerve and occasionally auditory nerve damage.

Referring to the more dangerous infections due to *Staph. aureus*, Dr. Williams said that prompt use of the best drug or combinations of drugs was imperative. That had been shown at the Royal Children's Hospital when an epidemic of staphylococcal pneumonia in infants occurred two years before. In many cases the organism was resistant to penicillin and streptomycin, or the response to those drugs was not good. Improved results followed the intravenous use of tetracycline on the patient's admission to hospital, to be followed by tetracycline by mouth after 24 to 36 hours, and Dr. Williams said he was grateful to Dr. J. Atkinson and Dr. G. Bearham for their help and observations at that time. At the present time, such patients would be treated with erythromycin on their admission to hospital.

In considering even more dangerous staphylococcal infection, particularly staphylococcal septicæmia associated with acute osteomyelitis, Dr. Williams said that there were three problems for discussion. Firstly, there was the resistance of the organism to the chosen antibiotic; in most cases it would respond to penicillin and erythromycin therapy. Erythromycin should be included in the drugs chosen for early treatment. Further guidance in antibiotic therapy was obtained from the sensitivity test, the result of which was read in accordance with the clinical assessment of the patient. Sometimes the administration of those drugs might be started before the patient was moved to hospital, but when possible, blood culture should be attempted first. Secondly, the resistance of the patient was a doubtful entity, and every assistance was required to improve it. The commonly accepted practice of blood transfusion was a case in point. It was possible to use staphylococcal antitoxin, but that had the disadvantage of being a horse serum, and large quantities were required, up to 30 millilitres given on one or two successive days. In the early research work on the staphylococcus, Professor Sir Macfarlane Burnet had shown the severely lethal quality of the staphylococcal toxin, but the exact mechanism by which that caused damage to the tissues was still unknown. Admittedly, that horse-serum antitoxin was shown to be of doubtful value when used alone before antibiotics were available, but it was possible that there was now a place for its use as an ancillary aid to chemotherapy. In the future, perhaps better antibiotics would be available. Of recent publication was the news of the properdine system, which was a euglobulin found in Fraction III of the serum, but so far not used clinically. Thirdly, the place of adrenal cortical compounds was one of considerable controversy. Dr. Williams was in favour of the use of prednisolone in severe infections dangerous to life, if it was certain that the organism was sensitive to the chosen antibiotic. Additional valuable aids in therapy of many staphylococcal infections, and to be used with discrimination when indicated by circumstances and sensitivity tests, were the antibiotics novobiocin and spiromycin. Recently, some emphasis had been placed on the use of combinations of antibiotics, and it seemed that resistance was delayed by that means, although it still occurred in staphylococcal infection. Such a combination was now under trial, known as "Sigmamycin" and "Synermycin".

DR. S. FISHER made some comment concerning the use of staphylococcal antitoxin. He said that during the past 12 months, in papers concerned with staphylococcal work in the experimental laboratory or clinical laboratories, it had been suggested that the alpha toxin and antitoxin system might not be as important in the causation and prevention of staphylococcal disease as it had hitherto been thought to be. Similar observations had been made in the laboratory at the Commonwealth Serum Laboratories. From the older literature, Topley and Wilson quoted recommendations for the use of staphylococcal antitoxin in the doses as large as 600,000 units. That might be regarded as supporting the view that antibodies other than alpha antihæmolysins were of significance. When clinicians considered using staphylococcal antitoxin, the administration of doses larger than those at present customary might be an advantage.

### Cystine Storage Disease.

DR. J. PERRY presented a case of cystine storage disease, which adhered fairly closely to the usual pattern of that syndrome. He pointed out, however, that for some months failure to thrive had been accompanied by a low-grade chronic urinary tract infection. Abnormal amino aciduria was demonstrated at that time, but not for some time were cystine crystals demonstrated in the bone marrow. In spite of treatment the condition of the patient deteriorated progressively, and gross photophobia occurred as a result of corneal deposits of cystine crystals. The terminal condition resembled urinary failure with azotæmia. Necropsy revealed infiltration of liver, spleen, kidneys and other organs with cystine crystals. Chemical investigation of the spleen revealed that the amino acid content was many times greater than in normal controls.

### Addison's Disease in Infancy.

DR. M. ROBINSON presented a paper entitled "The Clinical Syndrome and Treatment of Addison's Disease in Infancy". He said that adrenocortical insufficiency might result from the following causes: adrenocortical hypoplasia, hæmorrhage and replacement fibrosis of adrenal cortical tissue, congenital adrenal hyperplasia, adrenal cortical insufficiency. Three pathologically proved cases of hæmorrhage and replacement fibrosis of adrenal cortical tissue had been encountered at the Royal Children's Hospital, and an additional seven had been reported in the literature in infancy. Congenital adrenal hyperplasia produced the clinical picture of pseudo-hermaphroditism in the female and *macrogenitosomia præcox* in the male. The defect in that condition was now considered to be an enzyme block, which resulted in a state of hypoadrenalism. That in turn resulted in excessive secretion of ACTH, which caused hypertrophy of the adrenal cortex in an attempt to produce sufficient glucocorticoid and mineralocorticoid for homœostasis. However, that was not possible, and excessive production of sex steroid resulted, producing masculinization. The presence or absence of clinical manifestations of hypoadrenocorticism depended on the extent of the enzyme block. Prader had shown that the more markedly the female was masculinized, the more likely were Addisonian effects to develop. In the male infant with adrenal hyperplasia, excessive masculinization might be difficult to detect early, and the first symptoms were often those of adrenal cortical insufficiency. Adrenal cortical insufficiency might follow the removal of a functioning adrenal cortical tumour when the opposite adrenal was atrophic.

Dr. Robinson went on to say that, despite those varying ætiologies, the clinical pictures were very similar. The infants failed to gain in weight and were in a poor state of hydration despite a theoretically adequate fluid and caloric intake. They were always lethargic, fed poorly, and were subject to episodes of vomiting and occasionally diarrhœa. Pigmentation, best seen about the umbilicus, nipple and genitalia, might be present. However, the outstanding feature was dehydration in a baby whose dehydration could not be accounted for by poor intake, vomiting or diarrhœa. The cause of the dehydration was readily apparent when a 24-hour specimen of urine was obtained. Those infants passed relatively enormous quantities of urine. The symptoms might suddenly increase and convulsions might supervene, with death occurring in circulatory failure. The diagnosis was made easier by the presence of the genital anomalies. Further suggestive evidence was the presence of lowered serum sodium, chloride and bicarbonate levels, together with elevated potassium levels. Blood sugar levels might be markedly diminished. The diagnosis was established from urinary 17-hydroxysteroid and 17-ketosteroid levels. In adrenal hyperplasia, ketosteroid levels were increased beyond one milligramme in 24 hours. In both adrenal hyperplasia and hypoplasia, urinary 17-hydroxysteroid levels were diminished. Final proof of the diagnosis was in the response to substitution therapy.

With regard to therapy, Dr. Robinson said that should adrenal cortical insufficiency be acute and severe, homœostasis must be rapidly restored. The losses were of body water, $Na^+Cl^-HCO_3^-$, and glucose, and hence glucose-saline solution was infused intravenously. The actual amounts given would depend on the initial states of hydration and electrolyte depletion. Most authorities regarded DOCA as essential in the treatment of such a crisis, and many gave cortisone in addition. He himself thought that it was possible to treat such a crisis by the intravenous administration of saline and cortisone. Maintenance therapy of hypoadrenalism was a much more variable problem, but the treatment was the same no matter what the cause. As in adults with adrenal cortical insufficiency, the disease in infants varied in severity. Most authorities recommended maintenance with DOCA *plus* additional sodium chloride in the diet. He thought that it should be remembered that those infants bordered on hypoglycæmia, and cortisone corrected that abnormality. In addition, cortisone had salt-retaining properties, and when used with additional salt in the diet (3·5 grammes per day), it might be sufficient for maintenance and also obviate injections of DOCA. He had successfully maintained a patient with proved adrenal cortical insufficiency on such therapy, and a dose of 12·5 milligrammes of cortisone per day was usually sufficient. Some patients required DOCA, cortisone and salt for satisfactory control, and in two cases at the Royal Children's Hospital, doses of up to five grammes of sodium chloride, five milligrammes of DOCA, and 12·5 milligrammes of cortisone had been required for satisfactory maintenance. Satisfactory maintenance of such an infant was manifest clinically by the return of normal appetite and vigour, the maintenance of hydration, and normal weight gain in the absence of œdema and signs of excessive cortisone therapy. The presence of a normal serum electrolyte pattern was the other essential feature. Dr. Robinson said that he had had no experience in treating those infants by implantation of pellets of DOCA. However, most authorities did not regard such therapy as applicable to infants. At present he was attempting to stabilize such an infant with the trimethylacetate, an injection form of DOCA with a prolonged action of some three or four weeks. It appeared that that might be a practicable proposition. Otherwise those patients had to receive their daily injections as did the diabetic.

In conclusion, Dr. Robinson said that the syndrome of adrenal cortical insufficiency occurred and could be definitely diagnosed in infancy, but there were still many questions to be answered. The work of Jaudon suggested that the condition might on occasions be temporary, and Dr. Robinson had observed such a case. However, other patients required enormous dosages of salt and DOCA for their control. It had been suggested that the renal tubule was insensitive to DOCA in some of those cases, and therefore exhaustive tests of renal function might reveal a primary renal basis with secondary hormonal changes.

### Pulmonary Stenosis.

A symposium was held on "The Medical and Surgical Aspects of Pure Pulmonary Stenosis".

DR. M. POWELL, in opening the symposium, said that the term "pure" or "simple" pulmonary stenosis implied an obstruction, valvular, infundibular or sometimes both, to the outflow tract of the right ventricle, with an intact ventricular septum. The hæmodynamic stresses of the obstruction might ultimately force the *foramen ovale* to become functionally patent, or an actual auricular septal defect might be present—the so-called triad of Fallot—without altering the implications of the term. Surgical relief of the obstruction generally rendered the auricular septal deficiency and *foramen ovale* shunt relatively innocuous. On the other hand, the presence of a ventricular septal defect carried the condition into the realm of the tetrad of Fallot, which implied a vastly different approach. The stenosis was purely valvular in a high proportion of cases—about four valvular to one infundibular in some series, in the series under discussion it was considerably higher (28 out of 29 cases). Possibly many cases in which infundibular stenosis alone was found were in fact cases of non-cyanotic tetrad of Fallot.

In discussing the pathology of the condition, Dr. Powell said that the valve showed a curiously specific deformity. The basal ring was narrowed (a fact which sometimes rendered surgical relief more difficult), the cusps were ill-formed, distorted and adherent; the valve presented as a truncated cone with heavily scored sides and a small apical orifice, the diameter of which determined the severity of symptoms. The consistence of the valve tissue varied; at times it was very firm, but it might be relatively soft, capable of some movement in the cardiac cycle and of producing at times a split pulmonary second sound, which, however, was usually low-pitched and muffled, or absent in the severe cases. The right ventricle was always hypertrophied in all but the mildest cases. As time went on and continued stress took its toll, dilatation occurred, the tricuspid valve became incompetent, and this, *plus* the difficulty of complete emptying of the right ventricle with each systole, would force a shunt from the now dilated right auricle through an incompetent *foramen ovale* or an actual auricular septal defect into the left auricle. Cyanosis would now appear in what was really a non-cyanotic lesion. Exercise might produce that effect temporarily. The veins in the neck reflected the extension of right ventricular embarrassment and might show giant "a" waves. Towards the end the liver

would become enlarged and pulsation might be felt; shock waves in the veins of the neck would also indicate the transmission of right ventricular thrust through an incompetent tricuspid valve. The left ventricle, starved of its input, remained relatively small.

Referring to post-stenotic dilatation, Dr. Powell said that immediately distal to the stenotic site, whether it was valvular or infundibular, would be observed the phenomenon of post-stenotic dilatation. That phenomenon was of interest and great clinical importance. First observed distal to the constriction produced in the subclavian artery by a cervical rib and *scalenus anticus* muscle, it was now a familiar sight in angiocardiography, and in surgery upon such lesions as pure pulmonary stenosis, aortic stenosis and coarctation of the aorta. Holman had described what was undoubtedly its correct explanation. When a mass of fluid under high velocity passed through a constricted area, its velocity increased at the site of constriction by a degree inversely proportional to the square of the diameters of the normal and the constricted channels. That high-velocity jet emerging from the stenotic site struck the low-pressure, slowly moving blood mass and immediately set up a series of eddy currents, some of which actually travelled in reverse direction to the axial flow. There was an abrupt transference of the axial to a lateral force and of kinetic energy into potential energy. The continuation of those hydraulic forces over a long period and particularly their intermittent nature were responsible for structural fatigue in the wall of the vessel at the site of the eddying currents. Dilatation occurred as an inevitable result. The effect had been produced experimentally with rubber tubing. The phenomenon had great clinical importance, especially in regard to diagnosis in pulmonary stenosis. The pulmonary artery in the tetrad of Fallot never showed post-stenotic dilatation of any degree, because the septal defect allowed a deviation of the pulmonary stream into the aorta. Clinically the dilatation was often palpable as a systolic lift in the second left intercostal space. As the jet burst into the dead space with each systolic contraction of the hypertrophied right ventricle a loud "ejection" slap, sometimes called the spinnaker flap, initiated the first sound and was followed by the characteristic bruit. The surprising force of the lateral thrust at the dilated area was very evident at operation and under the X-ray screen, and was responsible for the wide distribution of the thrill—so wide at times that it carried to the aortic area and great vessels of the neck and clinically simulated aortic stenosis. When the stenosis was infundibular, a much less common phenomenon, the post-stenotic dilatation was in the nature of a sac-like dilatation just below the valves. It was not so readily visible in the X-ray screen and plate, but might be shown by angiocardiography.

Dr. Powell said that there were only three symptoms in that condition—limitation of effort, dyspnœa and, in severe cases with a forced intracardiac shunt, central cyanosis. Mild peripheral cyanosis might occur in cold weather, owing to lessened cardiac output and a peripheral stagnant anoxia. As might be expected, there was great variation in the severity of the symptoms. The size of the aperture in the deformed valve would be the prominent factor in production of symptoms. An infant might gasp out its life in a few days; others might carry on to adult life with minimal symptoms. All the patients with severe symptoms in the series studied had high-pressure gradients from right ventricle to pulmonary artery, but several patients with high-pressure gradients were surprisingly well. Time, of course, was a factor. It was probably correct to assume that a child of 14 years, however symptomless she might appear, who had a pressure gradient across her stenotic pulmonary valve of 125/10 to 17/10 millimetres of mercury would assuredly develop symptoms within a few years. Squatting, a prominent feature of the tetrad of Fallot, was rarely seen in pure pulmonary stenosis.

Dr. Powell then discussed the signs in eight groups. (i) The lesion was essentially non-cyanotic. A reversed intracardiac shunt through a forced *foramen ovale* or an actual auricular septal defect would produce persistent central cyanosis, and exercise might produce it temporarily. Peripheral cyanosis might occur in cold weather. (ii) Clubbing, polycythæmia and high hæmoglobin values would develop if central cyanosis was persistent. Otherwise those signs would not occur. (iii) The precordium was prominent in cases of some severity due to the right ventricular hypertrophy, and a right ventricular heave was palpable. Transmission of that impulse might be wide and extend to the jugular fossa and carotid trunks, thus simulating an aortic lesion. (iv) Auscultation showed a long, harsh, systolic bruit at the pulmonary area, usually initiated by a loud "ejection slap". That bruit, which was one of the most constant and helpful diagnostic features, tended to be conducted upwards rather than downwards—a point of distinction from the murmur of the ventricular septal defect. The second sound was usually single, soft and muffled or practically inaudible; but it was possible, in mild cases, for the pulmonary second sound to appear normally split. (v) Blood pressures were non-specific, and the tendency was towards low systolic and low pulse pressures. (vi) The electrocardiogram showed a right axis deviation and right ventricular hypertrophy pattern in practically all cases. Evidence of increasing strain on the right side of the heart might be demonstrated by increasing right ventricular hypertrophy and an *S-T* segment depression in lead III, and might be helpful in assessing the time for operation. The *P* wave was high and peaked in all cases associated with cyanosis. (vii) With regard to radiological features, in mild cases no abnormality might be noted; but it was striking how frequently the post-stenotic bulge was seen even in such cases. The classical picture (seen better with fluoroscopy) was that of a generally enlarged heart, with a large ventricular mass not tip-tilted, a very prominent and forcibly pulsating main pulmonary artery (at the site of the post-stenotic dilatation), but strikingly "quiet" main branches. The lung fields were notably oligæmic. The aortic arch had been left-sided in all cases studied. As cardiac embarrassment increased, the heart tended to become globular; the time for successful operation was passing when that occurred. The cardiac catheter had, of course, become of the utmost value in the diagnosis and estimation of the severity of the stenosis. (viii) In the presence of cyanosis, the angiocardiogram was helpful when it was vital to be sure one was not dealing with the tetrad of Fallot, for which the surgical approach was different. The lack of early filling of the left auricle and the simultaneous opacification of both pulmonary artery and aorta, and the absence of post-stenotic dilatation, were findings of great importance in establishing the diagnosis of the tetrad of Fallot.

Discussing the differential diagnosis in the absence of cyanosis, Dr. Powell considered five other conditions. (i) Auricular septal defect. In mild cases the murmur was sometimes soft and the pulmonary second sound loud and split. Those points, with the full pulmonary artery (post-stenotic dilatation) and a right-sided electrocardiogram, had suggested a small auricular septal defect. There could never be any confusion with a large auricular septal defect, because of the pulmonary plethora in that lesion. The catheter would be decisive. (ii) Aortic stenosis. So wide was the transmission of the vibration in the post-stenotic area that a thrill might be felt in the jugular fossa and carotid vessels. The bruit might be also widely distributed. However, the electrocardiogram should show left ventricular hypertrophy, there would be no post-stenotic dilatation of the pulmonary artery, and the lung fields would not be oligæmic. The catheter findings again would be decisive. (iii) Ventricular septal defect. If the pulmonary stenotic bruit was somewhat low (as might occur when the stenosis was infundibular), it would simulate that of the ventricular septal defect. The direction of propagation of the bruit was helpful—the more cranially it was heard the more likely was it to be due to pulmonary stenosis. Any tendency to be conducted towards the xiphisternum suggested the bruit of the ventricular septal defect. The pulmonary second sound might be helpful—it would be diminished in the stenotic lesion and exaggerated in the septal defect, but in mild cases it could be confusing. The electrocardiogram was more likely to be balanced in the septal defect (unless it was gross) than in pulmonary stenosis. (iv) The patent ductus. The bruit was different. In the case of patent ductus, the lung fields were plethoric, the electrocardiogram was balanced and the pulse pressure was higher. (v) The non-cyanotic tetrad of Fallot. That lesion could present considerable difficulty, but the following points were helpful. (*a*) The heart would not be enlarged; the contour was more likely to be that of the classical tetrad of Fallot—i.e., a concave pulmonary segment without post-stenotic dilatation and with the apex tip-tilted. (*b*) The aorta was more likely to be right-sided in the tetrad of Fallot. (*c*) The catheter findings or angiocardiogram might be diagnostic. In the presence of cyanosis, the tetrad of Fallot was the lesion to be distinguished, and the features indicated earlier might be helpful. The child with simple pulmonary stenosis who had become cyanotic was always severely ill, the heart was enlarged, and giant "a" waves were seen in the neck. Cyanosis was the normal hall-mark of the tetrad because of the over-riding aorta, which acted as a safety valve to the obstructed right ventricle, and the heart was relatively small. The angiocardiogram might be decisive. Differentiation was vital because of the different surgical approach.

With regard to the management of the patients, Dr. Powell said that there were three groups to be considered. The first comprised those with no symptoms and low right ventricular pressure (under 60 millimetres of mercury), of whom there were 15 in a series of 29 patients subjected to cardiac catheterization; in that group annual review was all that was necessary. The second group comprised patients with symptoms, especially those with cyanosis, and with high right ventricular pressures (over 100 millimetres of mercury), and in that group without doubt operation was indicated. Seven patients in the series had conformed to those criteria; six had been operated on with two deaths. The results in the survivors found on clinical examination and by cardiac catheterization were favourable. The third group comprised patients without symptoms, but with high pressures (over 100 millimetres of mercury), of whom there had been eight; those cases constituted the usual problem of submitting an apparently well child to a severe operation with appreciable risk. Decisions would become easier as experience grew.

DR. A. VENABLES then presented some aspects of the technique and interpretation of cardiac catheterization. He said that catheterization of the right side of the heart was an aid, in pulmonary stenosis, both to diagnosis and to determination of the severity of the lesion. In pulmonary valve stenosis a systolic pressure gradient existed between the right ventricle and the pulmonary artery. Assessment of the significance of that gradient demanded some knowledge of flow across the valve. Very high rates of flow, as in ventricular septal defect and auricular septal defect, with large shunts from left to right, had been demonstrated by Nadas *et alii* to cause in themselves gradients of up to 30 millimetres of mercury and perhaps higher without anatomical stenosis being present. However, true pulmonary stenosis might coexist with shunts, and should not be entirely disregarded. When flows were normal or low, a gradient of 10 to 15 millimetres of mercury meant some degree of stenosis.

It had become accepted to discuss the severity of pulmonary stenosis in terms of pressure gradient alone. That assumed flows to be comparable. In children, measurement of flow by the use of oxygen uptake was not satisfactory. All one could do was to try to have the conditions of the catheter approximate as closely to basal conditions as possible, by using minimal basal premedication and local anæsthesia and avoiding general anæsthesia. Obviously there was no problem in the case in which there was a demonstrated gradient of 150 millimetres of mercury, which was clearly very severe. When the gradient was, for instance, 80 to 90 millimetres of mercury, one could be dealing with a case of moderate severity, or with a very severe case in which the cardiac output was temporarily but considerably lowered. After the stenosis had been relieved by operation, the gradient fell greatly, to an extent depending on the efficiency of the operation, and might disappear (if there was no residual stenosis).

Dr. Venables went on to say that evidence of the site of stenosis rested on the observed position of the catheter tip when the gradient occurred during withdrawal of the catheter from the pulmonary artery to the right ventricle. In valve stenosis the tip then corresponded to the level of the valve ring. In addition, the curve changed sharply from a pulmonary artery tracing to the ventricular form. In infundibular stenosis the gradient occurred when the tip had been withdrawn below the valve, and there was also ordinarily an intermediate pressure zone with systolic pressure corresponding to the pulmonary artery, but lowered diastolic pressure. Mannheimer and his colleagues in their book had recently made reference to very high infundibular stenosis simulating valve stenosis in the withdrawal trace. Catheter findings should disclose the presence of an associated ventricular septal defect, even if the catheter did not cross to the left ventricle and aorta. When a significant shunt was present from left to right, it should be disclosed by the oxygen saturations. When the shunt was from right to left, as in Fallot's tetralogy, the clue would be given by the close and parallel relationship between right ventricular and systemic arterial pressures. In a proportion of cases of pulmonary valve stenosis, the catheter passed from the right atrium to the pulmonary veins via the left atrium. That was ordinarily via a patent *foramen ovale*, whose presence might have been suggested by cyanosis. In cases of central cyanosis, the systemic arterial oxygen saturation would be below normal.

Dr. Venables then said that the difficulties of cardiac catheterization in that condition were the same as for other congenital lesions. In a small child with unsatisfactory arm veins, the procedure might be performed from the groin via the long saphenous and femoral veins, the heart being entered through the inferior *vena cava*. By that route it was very difficult to enter the pulmonary artery. A large right atrium might also interfere with entry of the catheter into the right ventricle. Arrhythmias and varying degrees of heart block might complicate the procedure unpredictably, as with other lesions, but were ordinarily transient and ceased on withdrawal of the catheter. The difficulty peculiar to pulmonary stenosis was that a very narrow valve orifice might suffer further serious obstruction from the catheter. That should be anticipated and readily recognized. Lesser degrees of catheter obstruction (insufficient to produce alarming symptoms) might impede the circulation sufficiently to produce a lowering of oxygen saturation in the pulmonary artery relative to that previously or subsequently measured in the right ventricle and atrium. That was achieved by temporary greater peripheral desaturation, and samples taken simultaneously from ventricle and pulmonary artery would show the same saturation levels.

DR. R. HOWARD showed a film illustrating pulmonary valvotomy performed through the pulmonary artery with the patient under hypothermia. He discussed the relative merits of the approach to the pulmonary valve via the right ventricle and the pulmonary artery. He said it appeared that the approach through the ventricular wall was more likely to produce severe cardiac disturbance at the time of operation, and furthermore to leave a scar in the heart muscle which might subsequently stretch and form an aneurysm. The ventricular approach was blind, and it was impossible to state with certainty that the valve had been completely divided. On the other hand, the approach through the pulmonary artery was quick and readily performed under vision, with the certainty of complete division of the valve as projected. No cardiac disturbances had resulted from that approach, whereas in the one case in which the ventricular route had been used, death had resulted from ventricular fibrillation. Dr. Howard described the operative approach, and said that if a vertical incision with complete longitudinal division of the sternum was used, a perfect exposure of the region of the pulmonary valve was readily obtained without opening either pleural cavity; that was considered to be a distinct advantage.

Dr. Howard went on to say that five patients had been operated on by the pulmonary artery route. They had all been extremely ill and some of them desperately ill. Three had an associated auricular septal defect and were cyanosed. One patient died 48 hours after operation, and post-mortem examination showed severe degenerative changes in the liver. The other four patients were well and vastly improved, and the cyanosed patients dramatically improved. Pre-operative right ventricular pressures had been estimated when possible, and had been in the region of 180 millimetres of mercury. Post-operatively the pressures had fallen to 20 to 40 millimetres of mercury. Dr. Howard commented on the extremely poor condition of the patients he had mentioned, and said that the mortality was not unreasonable for that type of case. He thought that patients in whom the right ventricular pressure was raised above 100 millimetres of mercury should be subjected to valvotomy, even though symptoms were minimal. It would be reasonable to expect a very low mortality in such cases, whilst delay would put them into the group with damaged myocardium, a higher mortality and less satisfactory post-operative result in those who recovered.

DR. H. G. HILLER showed X-ray films and electrocardiographic tracings from a series of cases, and also demonstrated several cases of pulmonary stenosis.

*(To be continued.)*

## Out of the Past.

***In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.***

### ATTENDANCE OF STUDENTS AT OPERATIONS.[1]

[From the *Australasian Medical Gazette*, February, 1890.]

A DIFFICULTY has arisen in connection with lady medical students at the Melbourne Hospital. Some of the surgeons are averse to performing operations with a half dozen lady

[1] From the original in the Mitchell Library, Sydney.

students standing by deeply interested in the subject under dissection. Mr. Butters informed the Committee at a recent meeting that the male students—who number nearly 150—are also deeply concerned in the matter of the mixing of the sexes in the operating theatre, though whether their opinions on the point are attributable entirely to delicacy, or in part to the fact that the six lady students always get the best places to watch surgical operations, and cannot be jostled out of them, was not made perfectly clear. Dr. Molloy informed the Committee that some little difficulty was experienced in the same way at the Alfred Hospital. The objections in this case came also from the sterner sex. Some members of the Committee were surprised to learn that there were lady students in the hospital, and the medical superintendent and the surgical staff were asked to send in reports concerning the difficulty arising from their presence at operation.

# Correspondence.

## RECURRENT PYURIA.

SIR: Both Dr. L. D. Wheeler and Dr. A. R. Tink (M. J. AUSTRALIA, January 25, 1958) mention many ætiological factors in recurrent pyuria and an extensive series of pathological and other tests. Mention is also made of the fact that in spite of full urological investigation, there is a considerable number of cases in which infection persists in an apparently normal urinary tract. Most radiologists can recall many cases of chronic appendicitis where the offending organ, by its unusual relationship to the renal tracts or bladder wall, has produced the "red herring" signs and symptoms of a chronic urinary infection. I believe that the "silent" appendix is often forgotten in this era of chemotherapeutic and antibiotic agents.

Yours, etc.,

D. G. MAITLAND.

147 Macquarie Street,
Sydney,
January 28, 1958.

## EYE INJURIES IN INDUSTRY.

SIR: Dr. Kevin O'Day's comments on some aspects of Dr. Lennox Price's article on "Eye Injuries in Industry" (M. J. AUSTRALIA, November 23, 1957) are open to criticism. All agree that most of the industrial eye injuries are preventible—the blame cannot always be laid on the employer, who provides suitable shields for machines, goggles for the employees, etc.—often neglected by the workmen to their own detriment. Dr. O'Day stresses the loss of manpower-hours—with which I agree—but the prevention of some permanent visual loss should be of paramount importance. I refer chiefly to his remarks regarding foreign bodies in the cornea and their treatment. In a large industrial area such as Newcastle, many foreign bodies are removed from the cornea without any loss of manpower-hours or incapacity to the patient. The ophthalmic surgeon rarely sees these cases, as they are generally dealt with by the trained ambulance officers and medical practitioners at the works. Cases with foreign bodies embedded in the cornea with perhaps a ring of stain extending into the *substantia propria* as a rule are referred to an ophthalmic surgeon, especially if the pupillary area is involved. These are the cases for which I advise a pad and bandage after the necessary removal of the foreign body and all stain; the patient is told to report the following morning. The question of the loss of manpower-hours is far less important than the possibility of a corneal ulcer developing with scarring and perhaps some visual loss involving compensation. If it is the practice of Dr. O'Day to send these patients back to work without a bandage and tell them "to report back within two days if the eye has not returned to normal within that time", then, with all due respect to him, I can only say in my opinion it is not good advice, neither is it adequate treatment, and could be misleading to some medical practitioners.

I rather think he means the more superficial types of corneal foreign bodies, where nothing more than removal of the foreign body is necessary and a suitable antibiotic application to the eye, with which most ophthalmic surgeons would agree. Frequently, even after the more trivial foreign bodies of the cornea are removed, an eye will remain irritable and watery with staining of the cornea with fluorescein at the site of injury. A firm pad and bandage for 24 hours clears this up as a rule. The loss of a day's work is far less important from the patient's point of view than waiting for two days in discomfort.

I have treated some thousands of these cases over the past 43 years as an ophthalmic surgeon, and have never had cause to regret this policy which I have adopted, and which I still advocate.

Yours, etc.,

HUGH G. ALLEN.

16A Bolton Street,
Newcastle,
New South Wales.
January 28, 1958.

## THE EVALUATION OF TREATMENT.

SIR: Professor Lovell's enjoyable article, "The Evaluation of Treatment" (M. J. AUSTRALIA, January 25, 1958), seems a little short of the mark, perhaps intentionally so. The fact that a pharmacologically active remedy can be shown to have no effect on the progress of a disease as assessed by a properly conducted trial is not necessarily an argument against its use in individual cases. The clinician's role is surely to help the whole patient, not merely to treat his disease. In fact, many patients have symptoms and disability but no organic disease to explain them, and the clinician's relationship to the patient is in no way altered by this. A crucial point in the evaluation of treatment, therefore, is the response of the patient, not the disease, to the treatment. As Professor Lovell will no doubt agree, placebos are highly important therapeutic agents, and their nature is not entirely unimportant. Indeed, some patients receive psychotherapeutic benefit from the fashionable remedy according to its expense or reputed potency when applied to other circumstances irrespective of the doctor who prescribed it, but none the less these patients do receive benefit. It will take a deal of public education to accept benefit equivalent to £2,000,000 worth of vitamins from so much distilled water.

Regimens, such as diet for peptic ulcer patients, have a value apart from their effects or otherwise upon disease, in that they represent a positive form of placebo therapy. If surgery succeeds in a similar way, it could be argued that such surgery is justified, provided that there is no risk involved.

It is the patient who must believe in any treatment more than the doctor. Nevertheless, one might wonder whether a remedy would be more effective prescribed by one who believed it to be therapeutically important compared with one who realized he was prescribing a placebo. If this be so, scepticism has a danger—namely, that it may breed nihilism, where no treatment is given to a patient with a disorder on the grounds that no treatment has been shown statistically to alter its natural history. I suspect it will unhappily be a long time before therapeutics becomes a science needing no support from the magic mandragora.

Yours, etc.,

B. P. BILLINGTON.

201 Macquarie Street,
Sydney,
January 30, 1958.

## A NEW MEDICAL SCHOOL FOR NEW SOUTH WALES.

SIR: "Opinion is free, facts are sacred", said C. P. Scott, editor of the *Manchester Guardian*. The writer of your leading article entitled "A New Medical School for New South Wales" (January 25) is singularly misleading regarding the extent of the association between the University of London and its constituent medical schools when he states that "practically the only real association with a university" is "that it" (presumably the university) "acts as the examining body and confers the degrees".

This, as everyone knows who has any real knowledge of the London scene, is far from the truth. On the contrary the university influence and ideals permeate the daily life of the teaching hospitals and their medical schools, encouraging and fostering research, and through the Board of Advanced Medical Studies, composed of representatives of the university and of the medical schools, advising on and coordinating teaching. All the clinical professors and directors of clinical units in the hospitals are selected by a

joint board consisting of representatives of the university and of the medical school and hospital immediately concerned, together with two external experts in the particular specialty, nominated by the university. All members of the clinical staffs of the teaching hospitals are "appointed teachers" in the university.

In July of each year heads of professorial, clinical and other units are asked by the university to furnish to it a report on the work of the unit during the past year, including researches concluded or in progress, and a list of published papers.

In what way does all this, in the words of your leading article, "involve a compromise with expediency that we may well come to regret"?

Yours, etc.,

F. J. BROWNE.

2 Gillies Street,
Wollstonecraft,
New South Wales.
January 30, 1958.

[Professor Browne quite understandably sees the position from the top, and from that aspect our description is too much of an over-simplification. We were thinking of the position from the point of view of the student, who is the primary *raison d'être* for a medical school. His separation from the students of other faculties and from the common activities of a university does not help him to gain that "university education on broad and liberal lines" so strongly and wisely advocated for the medical student by the Goodenough Report.—EDITOR.]

## HÆMOGLOBIN VALUES OF SOME NATIVE INHABITANTS OF BOUGAINVILLE, NEW GUINEA.

SIR: Three years ago we were unable to find a paper recording so-called normal hæmoglobin levels in which any reference to protein nutritional status or serum albumin level was made; the analysis of diet given by Dr. Helen Cotter and her colleagues[1] adds materially to the value of their careful study. Particularly in view of the predominantly vegetarian diet described, we feel that the possible role of protein deficiency in producing the observed low mean hæmoglobin is dismissed rather more lightly than seems justifiable. Whipple's work, quoted in support of this view, was based on studies of hæmoglobin and serum protein production, as well as concentration levels, in protein-depleted dogs, artificially rendered anæmic, and fed certain selective diets. These findings may or may not be wholly applicable to human beings who are in almost the reverse situation—that is, they have become anæmic while living on a diet which is deficient in first-grade protein and possibly, of course, in other necessary substances. In any case we believe it is unwise to apply arguments based on Whipple's conclusions to the results of studies based on hæmoglobin and serum albumin concentrations alone, without concomitant estimations of total blood volume and calculation of total hæmoglobin and albumin values. Similarly, it is unwise in our view to exclude protein deficiency merely because serum albumin and/or hæmoglobin levels are within the normal range.

That variations in blood volume, conceivably closely related to changes in serum albumin level, can confuse the issue is illustrated by recent studies on "anæmia" in pregnancy and by our own observations[2] on healthy "normal" medical students. In a group of the latter, probably on a slightly lower protein intake than is usual in such a population, a high protein diet was found to produce a significant rise in serum albumin and significant fall in hæmoglobin level, the group being observed only over a period of two weeks. In effect, anæmia may be masked by hæmoconcentration with misleadingly normal serum albumin levels. At the time of this work a study of the literature left us with the impression that blood volume in severe protein deficiency states such as kwashiorkor and famine œdema may be either high or low. Adams[3] attributed to change in blood volume the fall in hæmoglobin and hæmatocrit values and the rise in serum albumin level which he observed in cases of kwashiorkor during treatment. The subsequent rise in hæmoglobin with continued treatment may reflect the slower production of hæmoglobin in response to adequate protein.

In regard to the lower values for hæmoglobin concentration in women, one of us (D.H.) was struck by the fact that in the Sepik district in north-west New Guinea, the very limited supply of first-grade protein available was preferentially distributed to the senior male members of the tribe, the women seemingly existing wholly on sago and tuberous roots.

These observations do not disprove the contentions of Dr. Cotter and her colleagues, but they do indicate that the complexity of the problem is such that, as they would doubtless agree, much more elaborate investigations than hæmoglobin and albumin concentrations are required to solve it.

Yours, etc.,

BRYAN GANDEVIA,
D. HOSSACK.

Melbourne,
Victoria,
January 23, 1958.

[1] M. J. AUSTRALIA, 1958, 1: 29 (January).
[2] M. J. AUSTRALIA, 1955, 1: 344.
[3] *Brit. M. J.*, 1954, 1: 537.

# Naval, Military and Air Force.

## APPOINTMENTS.

THE following appointments, changes etc. have been published in the *Commonwealth of Australia Gazette*, No. 3, of January 16, 1958.

### AUSTRALIAN MILITARY FORCES.

#### Citizen Military Forces.

*Northern Command.*

*Royal Australian Army Medical Corps (Medical).*—1/39213 Honorary Captain G. M. Windrum is appointed from the Reserve of Officers, and to be Captain (provisionally), 27th November, 1957. 1/39148 Captain F. Schubert is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command), 27th October, 1957.

*Eastern Command.*

*Royal Australian Army Medical Corps (Medical).*—2/147976 Lieutenant-Colonel K. B. Armstrong is appointed from the Reserve of Officers, is appointed Consultant Ophthalmologist, Army Headquarters, and to be Colonel, 1st July, 1957.

*Southern Command.*

*Royal Australian Army Medical Corps (Medical).*—To be Lieutenant-Colonel, 24th December, 1956: 3/157155 Major (Temporary Lieutenant-Colonel) R. S. Lawson.

*Western Command.*

*Royal Australian Army Medical Corps (Medical).*—The provisional rank of 3/129248 Captain C. R. Naylor is confirmed. 5/26543 Captain J. M. McKenna relinquishes the temporary rank of Major, 3rd December, 1957, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 4th December, 1957. To be Captain (provisionally), 29th November, 1957: 5/38069 Donald Henry Wallace.

#### Reserve Citizen Military Forces.

*Royal Australian Army Medical Corps (Medical).*

*Northern Command.*—To be Honorary Captains: Thomas Powell Thomas, 15th November, 1957, and Frances Ann Finlay, 18th November, 1957.

*Northern Command.*—Honorary Captain H. D. Ashton is retired, 31st December, 1957.

### ROYAL AUSTRALIAN AIR FORCE.

#### Permanent Air Force.

*Medical Branch.*

The probationary appointment of Flight Lieutenant R. W. Munson (0218089) is confirmed.

Flying Officer (Acting Flight Lieutenant) L. T. C. West (041923) is promoted to the rank of Flight Lieutenant, 30th March, 1957.

### Active Citizen Air Force.

*Medical Branch.*

*No. 22 (City of Sydney) Squadron.*—Flight Lieutenant D. L. Hudson (023909) is transferred to the Reserve, 14th October, 1957.

*No. 23 (City of Brisbane) Squadron.*—The following Flight Lieutenants are transferred to the Reserve: H. P. Dyer (011972), 27th May, 1955; R. J. M. Byrne (015118), 1st August, 1957.

### Air Force Reserve.

*Medical Branch.*

The following former officer is appointed to a commission, 1st February, 1957: Squadron Leader P. A. O'Brien (035952).

The following are appointed to a commission with the rank of Flight Lieutenant: Phillip Oystragh (268091), 5th November, 1956; Ian Calder Lewis (295567), 23rd February, 1957; John Leslie Tunley (445934), 4th April, 1957; Geoffrey James Bishop (257973), Peter Ronald Eisen (037777), John Aloysius Henderson (257974), 2nd May, 1957; Kenneth Wilber Bretherton (277662), 5th August, 1957; Desmond Leo Gurry (257978), 22nd August, 1957.

The following Air Cadets are appointed to a commission, provisionally, with the rank of Pilot Officer: David Alexander Noble (015181), 15th July, 1955; Bruce Aaron Levant (0311620), 23rd March, 1957; Patrick James Clark (0211596), Peter Frank Sinnett (0212683), Anthony Carl Thomson (0211613), Peter Robert Wakeford (0211614), 22nd June, 1957; Morris Walter Lewin (0115184), 13th August, 1957; John Atherton Young (015300), 16th August, 1957; Glen William Reed (0115713), 20th August, 1957; Ross Anthony Greet (015301), 11th September, 1957.

Flight Lieutenant L. E. Buley (0312748) is promoted to the temporary rank of Squadron Leader, 20th September, 1957.

Flight Lieutenant (Temporary Group Captain) C. H. C. Searby (2041) is placed on the Retired List, 1st July, 1957.

## Post-Graduate Work.

### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

#### Annual Subscription Course.

THE Post-Graduate Committee in Medicine in the University of Sydney, in conjunction with the Mater Misericordiæ Hospital, North Sydney, has arranged a course of two lectures entitled "The Doctor and the Spiritual Care of the Patient". The speakers will be the Reverend Father Peter Little, S.J., and the Reverend W. D. O'Reilly, Vice-Principal of the Methodist Theological College, who will lecture jointly on Wednesday, March 19, and Wednesday, March 26. Both lectures will begin at 8.15 p.m., and will be held at the Mater Misericordiæ Hospital, Pacific Highway, North Sydney.

#### Revision Course at Rachel Forster Hospital for Women and Children.

A revision course will be held at the Rachel Forster Hospital for Women and Children for one week, full time, from Monday to Friday, September 29 to October 3, 1958. The course is open to all members of the medical profession, and limited accommodation is available for women graduates at a cost of £3 13s. 6d. A detailed programme will be published later.

The fee for attendance is £5 5s., and written application, enclosing remittance and indicating whether accommodation is required, should be made to the Course Secretary, Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, not later than August 29, 1958. A minimum number of eight candidates is required. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

### SEMINARS AT SYDNEY HOSPITAL.

THE following seminars will be held on Wednesday from 2 to 3 p.m. in the Maitland Lecture Hall, Sydney Hospital, from March 12 to April 30, 1958. The seminars will be preceded by medical grand rounds (Maitland Lecture Hall) at 12 noon, lunch at 1 p.m., and pathological demonstrations (Maitland Lecture Hall) at 1.30 p.m. March 12, neurology clinic, "Migraine and its Variants", Dr. K. B. Noad. March 19, thoracic clinic, "Sarcoidosis at Sydney Hospital", Dr. B. R. M. Hurt. March 26, "The Management of Hypertension", Professor M. Rosenheim, London. April 2, gastroenterology clinic, "The Chronic Appendix", Dr. A. E. McGuinness, Dr. A. A. Palmer. April 9, hæmatology clinic, "Megaloblastic Anæmias", Dr. R. J. Elvy. April 16, rehabilitation unit, Prince of Wales Division, Sydney Hospital, "Medical Rehabilitation", Dr. R. I. Meyers. April 23, "Early Manifestations of Schizophrenia", Professor W. H. Trethowan, Department of Psychiatry, University of Sydney. April 30, endocrine clinic, "Hormones of the Adrenal Cortex", Dr. P. F. Hall.

### THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR MARCH, 1958.

#### Courses for Higher Qualifications.

A COURSE in pathology for the M.D. degree and the diplomas will commence at the University of Melbourne at 1.30 p.m. on Monday, March 3. This will continue for two hours each Monday and Wednesday till late June, and will consist of practical classes and lectures. Courses in anatomy and physiology, commencing in February, will also continue on Monday and Wednesday afternoons, at 2.15 p.m. and 3.45 p.m. respectively. The fees for the above-mentioned courses are £21 per subject, and enrolments, on the Committee's form and accompanied by the fee, should be made as soon as possible.

A course in surgery, suitable for candidates for senior surgical qualifications, will commence on March 17 and continue till April 24, at the Royal Melbourne Hospital. From 4 p.m. on Mondays, Tuesdays, Thursdays and Fridays, the honorary surgical staff will conduct classes in clinical surgery. Those attending will also have access to the operating theatres and the general surgical work of the hospital. The fee for the course is £10 10s., and enrolments should be made through the Melbourne Medical Post-Graduate Committee. Entries close on February 28.

The course in anæsthesia and medicine suitable for candidates for the F.F.A.R.A.C.S. and for others, announced in a previous programme, commences on March 17.

The Victorian Mental Hygiene Authority will conduct a series of post-graduate lecture demonstrations in psychiatry, commencing on April 1 and lasting for three months. Classes will be held from 8 till 8.50 p.m. and from 9 till 9.50 p.m. on Tuesdays. Supper will be served between classes. The course is open to all medical practitioners, and inquiries should be addressed to the Chief Clinical Officer, Mental Health Research Institute, Receiving House, Royal Park.

#### Country Courses.

*Mooroopna.*—On March 15, at the Mooroopna Base Hospital, the following lectures will be given: 2.30 p.m., "Diagnosis and Management of Chronic Dyspepsia", Dr. John Stubbe; 4.30 p.m., "The Management of a Lump in the Breast", Professor Maurice Ewing. Dr. B. R. Schloeffel, Maud Street, Shepparton, is the local secretary.

*Ballarat.*—On March 27, at Craig's Hotel, Ballarat, at 8 p.m., Dr. D. L. G. Thomas will discuss "Hazards of Industry, Chemical and Physical". Dr. N. Pescott, 626 Sturt Street, Ballarat, is the local secretary.

*Fees.*—Fees for the above-mentioned country courses are at the rate of 15s. per lecture, but those who have paid an annual subscription to the Committee are invited to attend without further charge.

#### Flinders Naval Depot.

At Flinders Naval Depot, on March 12, at 2.30 p.m., Mr. J. Peters will discuss "The Mechanics of Obstruction: Surgical Management of Hydronephrosis", and a film will be shown. This course is held by arrangement with the Royal Australian Navy.

#### Course on Cardio-Pulmonary Function.

Attention is drawn to the course in the scientific basis of medicine which the Melbourne Medical Post-Graduate Com-

mittee will conduct on Friday evenings once a month from May to October, at the Royal Melbourne Hospital, on the subject of "Cardio-Pulmonary Function" Further details will be announced later.

*INFORMATION.*

The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne. Telephone: FB 2547.

## Australian Medical Board Proceedings.

### NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, in accordance with the provisions of the *Medical Practitioners Act, 1938-1957.*

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*a*) of the Act: Douglas, Gerald Leslie, M.B., B.S., 1957 (Univ. Sydney); Parisi, Rosario, M.B., B.S., 1956 (Univ. Queensland); Thomson, Ronald Leslie, M.B., B.S., 1956 (Univ. Queensland).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*b*) of the Act: Carroll, David Swainston, M.R.C.S. (England), L.R.C.P. (London), 1951; Daly, Patrick Joseph, M.B., B.Ch., 1938 (N.U. Ireland), D.O.M.S. (Ireland), 1948; Dunlop, George Alexander, M.B., Ch.B., 1924 (Univ. St. Andrews), M.D., 1931 (Univ. St. Andrews), D.T.M. (Liverpool), 1927, D.T.H. (Liverpool), 1927; Jones, Frank Whitwam, M.B., B.S., 1954 (Univ. London); Potter, Newton, M.B., B.S., 1955 (Univ. Durham); Stuart, William Iain, M.B., Ch.B., 1950 (Univ. Edinburgh); Thompson, David Charles, M.R.C.S. (England), L.R.C.P. (London), 1950.

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*c*) of the Act: Ackermann, Isidor Anthony, M.D., 1940 (Univ. Bucharest); Eikens, Arnolds, M.D., 1935 (Univ. Riga); Petersons, Valdemars Vladislavs, M.D., 1943 (Univ. Riga); Simkovics, Gusztav, M.D., 1939 (Univ. Debrecen).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2) of the Act: Pal, Andor, M.D., 1933 (Univ. Budapest).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (2A) of the Act: Goldberg, Aron, M.D., 1949 (Univ. Paris); Levitski, Aleksander, M.B., 1923 (Univ. Tartu).

Registered medical practitioner who is required to complete twelve months' hospital service in accordance with the provisions of Section 17 (3) and is registered under Section 17 (1*a*) of the Act: Harper, Judith Mary, M.B., B.S., 1957 (Univ. Adelaide).

Registered medical practitioners who are required to complete twelve months' hospital service in accordance with the provisions of Section 17 (3) and are registered under Section 17 (1*c*) of the Act: Bagdonavicius, Irene, M.D., 1949 (Univ. Tubingen); Goldner-Reiss, Irma, M.D., 1938 (Univ. Vienna); Lieder-Mrazek, Michael, M.D., 1950 (Univ. Munich).

Registered medical practitioners who have been issued with licences under Section 21C of the Act:

Hornyckyj, Jaroslav, M.D., 1937 (Univ. Graz); Slavotinek, Hynek, M.D., 1926 (Univ. Brno).

### QUEENSLAND.

THE following have been granted limited registration, pursuant to the provisions of Section 20 (3) of *The Medical Acts*, 1939 to 1955, of Queensland: Apel, John Victor Tucker, M.B., B.S., 1957 (Univ. Queensland); Barcham, John Dallas, M.B., B.S., 1957 (Univ. Queensland); Benson, Francis Rupert, M.B., B.S., 1957 (Univ. Queensland); Brennan, Colin Kenneth, M.B., B.S., 1957 (Univ. Queensland); Bricknell,

### DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JANUARY 18, 1958.[1]

| Disease. | New South Wales. | Victoria. | Queensland. | South Australia. | Western Australia. | Tasmania. | Northern Territory. | Australian Capital Territory. | Australia. |
|---|---|---|---|---|---|---|---|---|---|
| Acute Rheumatism | 4(1) | 5(5) | 2(1) | .. | .. | .. | .. | .. | 11 |
| Amœbiasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ancylostomiasis | .. | .. | 5 | .. | .. | .. | .. | .. | 5 |
| Anthrax | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Bilharziasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Brucellosis | .. | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Cholera | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chorea (St. Vitus) | 1(1) | .. | .. | .. | .. | .. | .. | .. | 1 |
| Dengue | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Diarrhœa (Infantile) | 3(1) | 20(17) | 2(2) | .. | .. | .. | .. | 1 | 26 |
| Diphtheria | .. | 3 | .. | 1 | .. | .. | .. | .. | 4 |
| Dysentery (Bacillary) | .. | 2(2) | 1 | .. | 3(3) | .. | .. | .. | 6 |
| Encephalitis | .. | 2(1) | .. | .. | .. | .. | .. | .. | 2 |
| Filariasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Homologous Serum Jaundice | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hydatid | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Infective Hepatitis | 34(20) | 13(4) | 2 | 5(3) | 10(1) | .. | .. | .. | 64 |
| Lead Poisoning | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Leprosy | .. | .. | .. | .. | 1 | .. | .. | .. | 1 |
| Leptospirosis | .. | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Malaria | .. | .. | .. | .. | .. | .. | 1 | .. | 1 |
| Meningococcal Infection | 2(2) | 4(3) | 2(1) | .. | .. | .. | .. | .. | 8 |
| Ophthalmia | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ornithosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Paratyphoid | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Plague | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Poliomyelitis | 1 | .. | .. | 3(2) | .. | .. | .. | .. | 4 |
| Puerperal Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rubella | .. | 69(59) | .. | 1 | 10(10) | .. | .. | .. | 80 |
| Salmonella Infection | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Scarlet Fever | 13(4) | 17(16) | 4(2) | 1(1) | .. | .. | .. | .. | 35 |
| Smallpox | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tetanus | .. | .. | 1(1) | .. | .. | .. | .. | .. | 1 |
| Trachoma | .. | .. | .. | .. | 1 | .. | .. | .. | 1 |
| Trichinosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tuberculosis | 25(13) | 26(23) | 16(6) | 6(4) | 8(6) | 5(4) | 1 | 1 | 88 |
| Typhoid Fever | .. | 1 | .. | .. | .. | .. | .. | .. | 1 |
| Typhus (Flea-, Mite- and Tick-borne) | .. | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Typhus (Louse-borne) | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yellow Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. |

[1] Figures in parentheses are those for the metropolitan area.

Daniel, M.B., B.S., 1957 (Univ. Queensland); Brown, Robert Rowland Edkine, M.B., B.S., 1957 (Univ. Queensland); Cairns, Peter John, M.B., B.S., 1957 (Univ. Queensland); Cary, Jill Maude, M.B., B.S., 1957 (Univ. Queensland); Cohen, David Julius, M.B., B.S., 1957 (Univ. Queensland); Comerford, John Anthony, M.B., B.S., 1957 (Univ. Queensland); Conomos, Nicholas, M.B., B.S., 1957 (Univ. Queensland); Cooper, David Henry, M.B., B.S., 1957 (Univ. Queensland); Crane, Gordon Gregory Gibson, M.B., B.S., 1957 (Univ. Queensland); Crawford, William John, M.B., B.S., 1957 (Univ. Queensland); Daly, Louis Francis, M.B., B.S., 1957 (Univ. Queensland); Delaney, James Joseph, M.B., B.S., 1957 (Univ. Queensland); Douglas, Barbara Marion, M.B., B.S., 1957 (Univ. Queensland); English, Peter Francis James Devarney, M.B., B.S., 1957 (Univ. Queensland); Fardoulys, Nicholas, M.B., B.S., 1957 (Univ. Queensland); Fung, Andrew (Foeng Kue Soo), M.B., B.S., 1957 (Univ. Queensland); Garrett, Mervyn Henry, M.B., B.S., 1957 (Univ. Queensland); Gordon, Richard Douglas, M.B., B.S., 1957 (Univ. Queensland); Gourin, Anatole, M.B., B.S., 1957 (Univ. Queensland); Graff, Rupert Feodor, M.B., B.S., 1957 (Univ. Queensland); Grice, Melody Joy, M.B., B.S., 1957 (Univ. Queensland); Harry, Elaine Dorothy, M.B., B.S., 1957 (Univ. Queensland); Harte, John Sylvester, M.B., B.S., 1957 (Univ. Queensland); Hawes, Lawrence Neil, M.B., B.S., 1957 (Univ. Queensland); Hickey, Howard Thomas, M.B., B.S., 1957 (Univ. Queensland); Johnson, Leslie Bruce, M.B., B.S., 1957 (Univ. Queensland); Kerr, John Foxton Ross, M.B., B.S., 1957 (Univ. Queensland); Lowrey, Joan Margaret, M.B., B.S., 1957 (Univ. Queensland); Middleton, George, M.B., B.S., 1957 (Univ. Queensland); Monteath, David Colin, M.B., B.S., 1957 (Univ. Queensland); Morrow, Colin Arthur, M.B., B.S., 1957 (Univ. Queensland); McIver, Margot Anne, M.B., B.S., 1957 (Univ. Queensland); McLeod, George Roderick Cooper, M.B., B.S., 1957 (Univ. Queensland); Noble, David Alexander, M.B., B.S., 1957 (Univ. Queensland); Noblett, Helen Rae, M.B., B.S., 1957 (Univ. Queensland); Nussey, Frederick John Reid, M.B., B.S., 1957 (Univ. Queensland); Pietsch, James, M.B., B.S., 1957 (Univ. Queensland); Popper, Eva Irene, M.B., B.S., 1957 (Univ. Queensland); Porter, Geoffrey Thomas James, M.B., B.S., 1957 (Univ. Queensland); Roberts, Sydney James John Cecil, M.B., B.S., 1957 (Univ. Queensland); Roberts, Sydney James John Cecil, M.B., B.S., 1957 (Univ. Queensland); Robertson, Alan Ian, M.B., B.S., 1957 (Univ. Queensland); Seymour, John Leonard, M.B., B.S., 1957 (Univ. Queensland); Smith, Valerie Jean, M.B., B.S., 1957 (Univ. Queensland); Stewart, Cameron Alexander, M.B., B.S., 1957 (Univ. Queensland); Tait, Ian Alexander, M.B., B.S., 1957 (Univ. Queensland); Ti, Michael (Ti Teow Siew), M.B., B.S., 1957 (Univ. Queensland); Townley, Kenneth Russell, M.B., B.S., 1957 (Univ. Queensland); Whitaker, Alan Nelson, M.B., B.S., 1957 (Univ. Queensland); White, David, M.B., B.S., 1957 (Univ. Queensland); Young, Leonard Neville, M.B., B.S., 1957 (Univ. Queensland).

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Bencsik, Albert Frank, M.B., B.S., 1957 (Univ. Sydney), Mater Misericordiæ Hospital, Crow's Nest, New South Wales.

Sloane, David Rae, M.B., B.S., 1956 (Univ. Sydney), 49 Moonbie Street, Summer Hill, New South Wales.

Goldner-Reiss, Irma, M.D., 1938 (Univ. Vienna) (registered in accordance with the provisions of Section 17 (1c) of the *Medical Practitioners Act*, 1938-1957), 56 Bay Street, Mosman, New South Wales.

## Deaths.

THE following deaths have been announced:

MACKAY.—Eric Reay Mackay, on January 26, 1958, at Toorak, Victoria.

MCPHERSON.—John McPherson, on January 28, 1958, at Sandringham, Victoria.

THOMSON.—George Macdonald Thomson, on February 1, 1958, at Newton, New South Wales.

## Medical Appointments.

Dr. Selwyn Nelson has been appointed a member of the Nurses Registration Board in the Department of Public Health, New South Wales.

## Diary for the Month.

FEB. 18.—New South Wales Branch, B.M.A.: Medical Politics Committee.
FEB. 20.—Victorian Branch, B.M.A.: Executive Meeting.
FEB. 21.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 25.—New South Wales Branch, B.M.A.: Hospitals Committee.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

*New South Wales Branch* (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

*Queensland Branch* (Honorary Secretary, 88 L'Estrange Terrace, Kelvin Grove, Brisbane, W.1): All applicants for Queensland State Government Insurance Office positions are advised to communicate with the Honorary Secretary of the Branch before accepting posts.

*South Australian Branch* (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

## Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

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